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Syllabus

TECHNOLOGY FOR HIGHER EDUCATION

FEBRUARY 2003 • VOLUME 16, NO. 7

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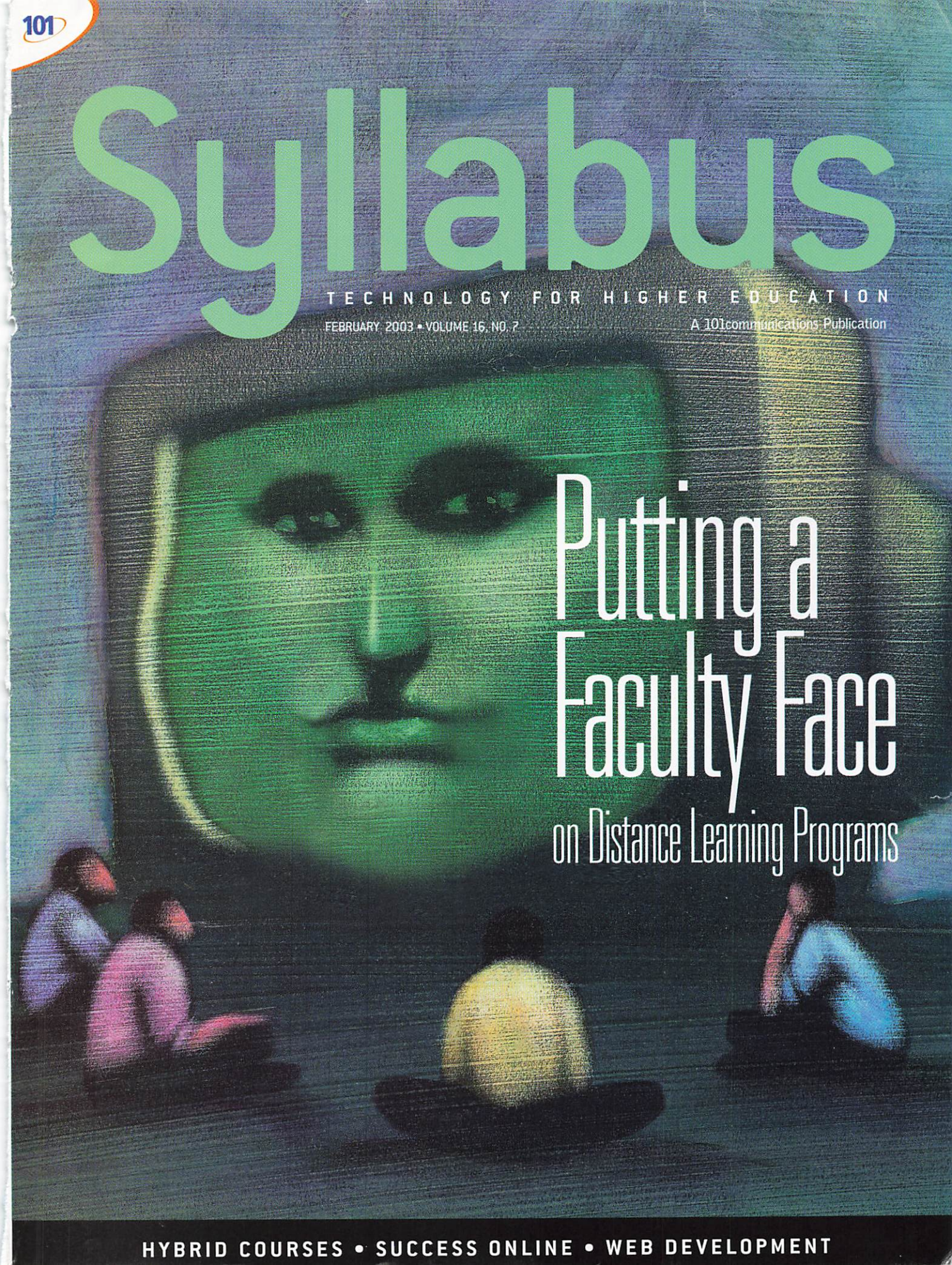

Putting a Faculty Face on Distance Learning Programs

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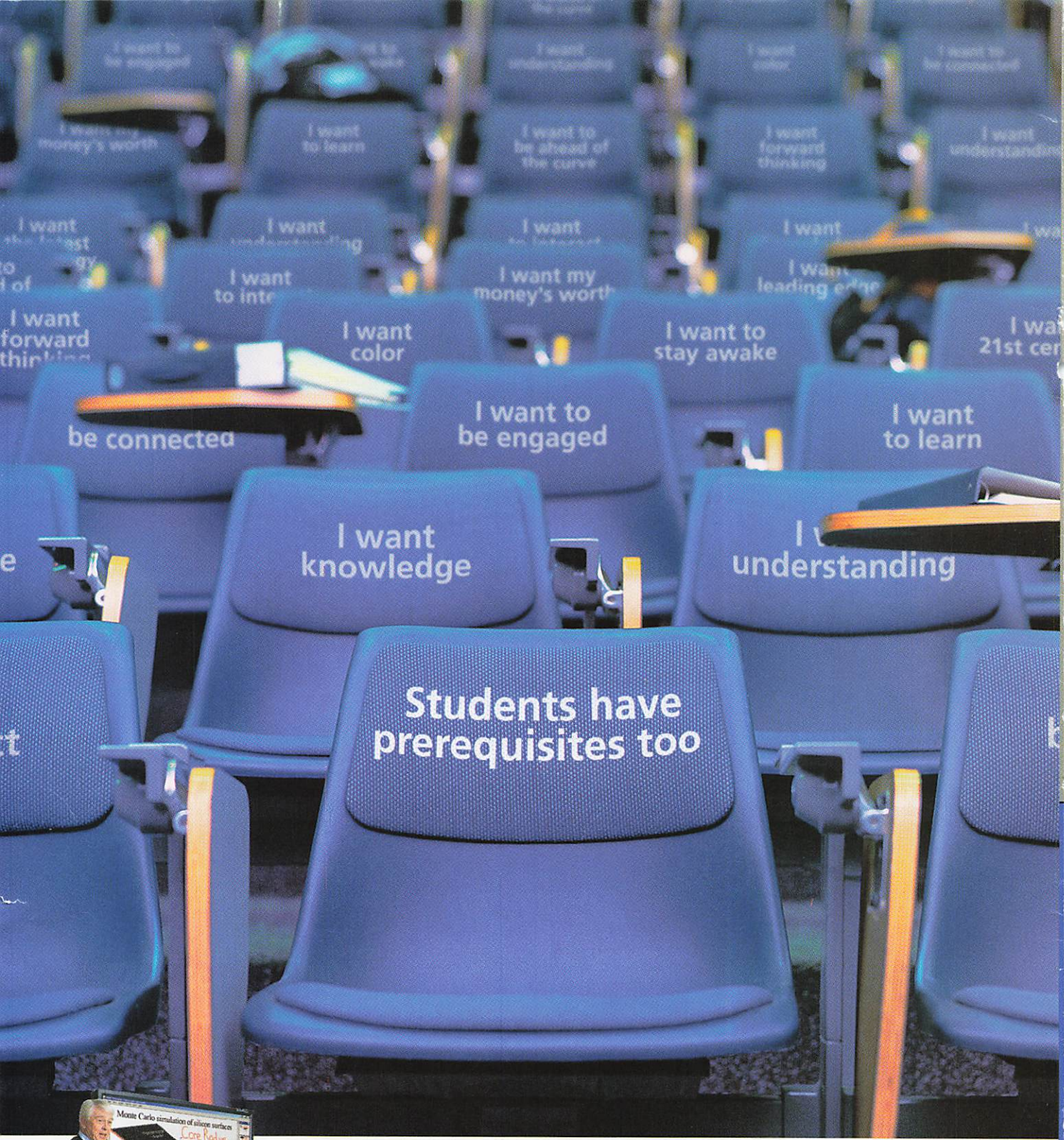

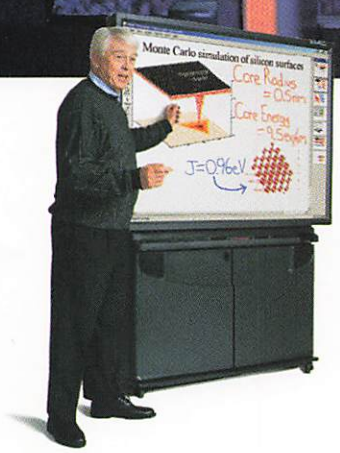

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TECHNOLOGY FOR HIGHER EDUCATION

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EDITOR'S NOTE

Mary Grush, Editor

Distance learning has come a long way since the days of mail-order course packets and video cassettes. Today, streaming media, interactive Web pages, and high-speed Internet connections are presenting new opportunities for distance learning programs to foster better communication, collaborate and share resources, and distribute education widely and equitably. Strategists indicate that more advanced technologies will someday be commonplace in distance education programs, and the future is coming fast. Handheld devices, wireless connectivity, simulations, virtual reality—all the promising education technologies—will have something to offer in distance learning environments.

"High speed" and "high bandwidth" are among the watchwords ushering in a new era of distance education-but what about "high quality"? Happily, leaders in distance education have thought of that, too. In our lead feature, "Putting a Faculty Face on Distance Education Programs" (page 10), Bill Riffee examines the role of the facilitator in the University of Florida's distance education programs. To ensure a quality experience for distant learners, the university places a local faculty facilitator to guide, coach, teach, and encourage interaction.

The emphasis placed on student interaction with faculty facilitators and course instructors is certainly a move in the right direction, if not the key to success in online instruction. In an article outlining principles for building quality online education (page 14), Jacqueline Moloney and Steven Tello explain how the concerns of traditional faculty were embraced at the University of Massachusetts-Lowell, where they designed "online courses that enhance interaction and uphold quality."

With the quickening pace of information in general, knowledge systems are more dynamic than they ever were, and so are courses. Static, rule-based computer-assisted instruction systems are not likely to be useful in such an environment. The continuous involvement of faculty and instructors will help create high-quality distance education programs where faculty-student interactions will not only distribute knowledge, but also leave open the chance for inquiry—and for new ideas to be formed.

Do you have a question about education technology or an opinion that you feel should be heard? Take a minute to share your thoughts in the online Forums at www.syllabus.com. From the Syllabus home page, go to the Community section and select the link to Forums. It's an informal and easy way to exchange information and have a voice in the larger community. The Forums section is a relatively new feature on the Syllabus Web site that is being discovered by many visitors. Join them now!

Save the dates for Syllabus2003, our tenth annual summer conference, July 27-31. The conference will be held in the newly constructed Marriott Hotel in San Jose, Calif., attached to the downtown convention center. Many exciting sessions and events are planned, including a day of sampling the latest education technology in action on the campus of Stanford University. For conference updates, visit www.syllabus.com.

Enjoy this copy of *Syllabus!*

Mary Grush

Letters to the editor should be addressed to the editor and sent to 101 First Street, #605, Los Altos, CA 94022, or via electronic mail. We reserve the right to edit all submissions. **News and product information** will be considered for publication. Please send all materials to Paul McCloskey. If you are interested in writing for *Syllabus*, please send a brief description of your article idea along with writing samples to the editor at the above address.

Syllabus

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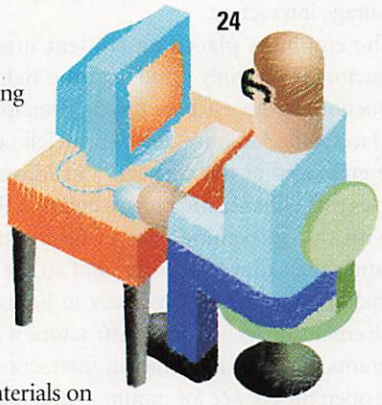

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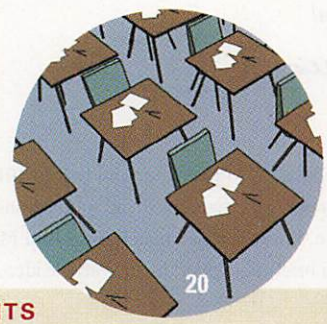

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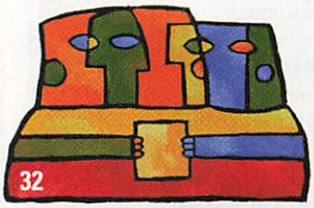

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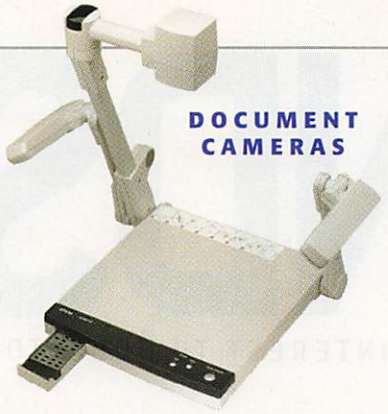

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Phillip D. Long

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TRENDS

AN INFORMATION RESOURCE OF INTEREST TO EDUCATORS

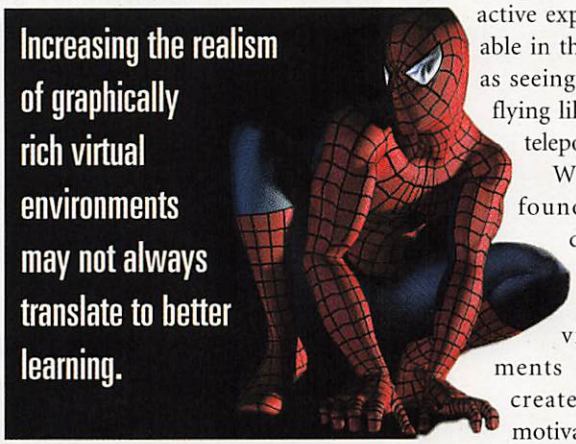
Briefs

- **Stanford University** established a "nano-characterization facility" to provide micro-instrumentation to faculty in the fields of physics, biology, chemistry, and computer science.
- Career education provider **Corinthian Colleges Inc.** said it would acquire the assets of training course supplier **Learning Tree University** in a deal worth $5.3 million.
- The number of admissions applications **California State** received via the Internet increased 47.5 percent during the two-month fall enrollment period of Oct. 1 through Nov. 30, 2002.
- A report by the **Center for Telecom Management at Southern Cal** predicts 2003 will be a boom year for short message services (SMS)—text messaging between mobile phones or to an e-mail address.

For these and other news stories, or to subscribe to the weekly Syllabus e-News, Resources, and Trends, visit www.syllabus.com.

How Much Reality Does Simulation Need?

Today's students are immersed in a world of images that draw them into multi-sensory experiences. These are often provided by various entertainment genres, from video games (individual or multi-user) to movies. Young people and old find the engagement compelling, which has lead to the burgeoning gaming industry and laments from the English faculty about the deterioration of linear narrative.



Increasing the realism of graphically rich virtual environments may not always translate to better learning.

Developments in computer graphics have brought a new realism to video games, movies, and simulations. Blending reality with a suspension of physical constraints made possible by computer simulation has given rise to characters such as Spiderman, who swings by a thread through the canyons of Manhattan. We perceive that experience unfolding as "real." Now, while we certainly remember these scenes from the cinema, if the same computational power were applied to learning would the impact be as powerful?

Chris Dede at Harvard has been studying the impact of adding multi-sensory perceptual information to aid students struggling to understand complex scientific models. He and his colleagues have built virtual environments such as NewtonWorld and MaxwellWorld to test how they affect learning. Providing experiences that leverage human pattern recognition capabilities in three-dimensional space (e.g., shifting among various frames-of-reference and points-of-view) also extends the perceptual nature of visualization.

Their work has concentrated on middle school students who have not scored well on standardized tests of scientific understanding. Among the questions they are investigating is what the motivational impact that graphical multi-user simulation environments have on learning. These environments include some or all of the following characteristics: 3-D representations; multiple perspectives and frames-of-reference; multi-modal interface; simultaneous visual, auditory, and haptic feedback; and interactive experiences unavailable in the real world such as seeing through objects, flying like Superman, and teleporting.

What have they found? With careful design, the characteristics of multi-dimensional virtual environments can interact to create a deep sense of motivation and concentration, thus helping students to master complex, abstract material.

This might suggest that the more realistic the virtual environment becomes the better the learning. Maybe. Of course, these technology-infused approaches to learning are the modern day version of John Dewey's assertion that students learn by doing. Translated into today's computer-enhanced learning environment, the rich perceptual cues and multi-modal feedback (e.g., visual, auditory, and haptic) that are provided to students in virtual environments enable an easier transfer of simulation-based training to real-world skills (Dede, C., Salzman, M.C.; Loftin, R. B.; and Sprague, D., 1999).

The situation is, in the words of the famous

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"8-ball" predictor of the future, "decidedly mixed," however. In the mid-1990s several studies found that guidance was critical in deriving the greatest value in simulation exercises. When students in a graphically rich multi-sensory learning activity do not know how to complete a given task, the learning process can get bogged down as the students search for some method of completing it (Hill & Johnson, 1995). If they do not have a clear understanding of the tasks they are being taught and asked to learn, they may perform them erroneously without realizing it, and thus learn the task incorrectly. Furthermore, the students might acquire incorrect models of the systems with which they are interacting (Self, 1995).

What to do? One approach is to support collaborative learning, in which groups of students work together within the virtual environment. Having students work together is frequently an effective way to enhance learning. However, a group of students who are equally unfamiliar with the concept being taught duplicate and reinforce each other's mistakes. Students who rely too much on the assistance of their colleagues may excessively interrupt and divert their attention, and slow the progress of the group.

Another approach is to have intelligent software agents that provide guided assistance to the student. This has been done in training for complex machinery, where a virtual autonomous agent demonstrates tasks, offers advice, and answers questions (Rickel, Stiles, and Munro, 1998).

Increasing the realism of graphically rich virtual environments, however, may not always translate to better learning. Developers of flight control environments have found that pilots are flooded with data. The information they need to fly their planes, however, is only a select subset of the information available. In fact, learning complex flight maneuvers may be impeded by the distractions of simulated reality and accelerated if only relevant information is provided, with the rest filtered out.

When training operators to remotely operate unmanned air vehicles (UAVS), researchers looked at the effects of the level of automation on the number of simulated remotely operated vehicles that could be successfully controlled by a single operator (Ruff H.A., Narayanan S., and Draper M.H., 2002). Their findings revealed that as the number of remote vehicles increased, the operator's ability to pilot the drones decreased when they flew them manually.

However, if the autonomous controls made the flight decisions, and the controllers had only to correct the automated choices, they reported both higher levels of stress and performed poorly. Having the UAV autonomously make flight decisions, but requiring the operator to confirm the decision before they were made resulted in the highest performance. Apparently giving the operators selected tasks, but automating major parts of a complex activity lead to maximum performance.

Creating simulations with life-like realism is increasingly possible with computers growing in power every few months. Like many things with technology, just because we can do something may not mean we should. But there is one thing we could do to augment the multi-user virtual environment. We could add ... a teacher!

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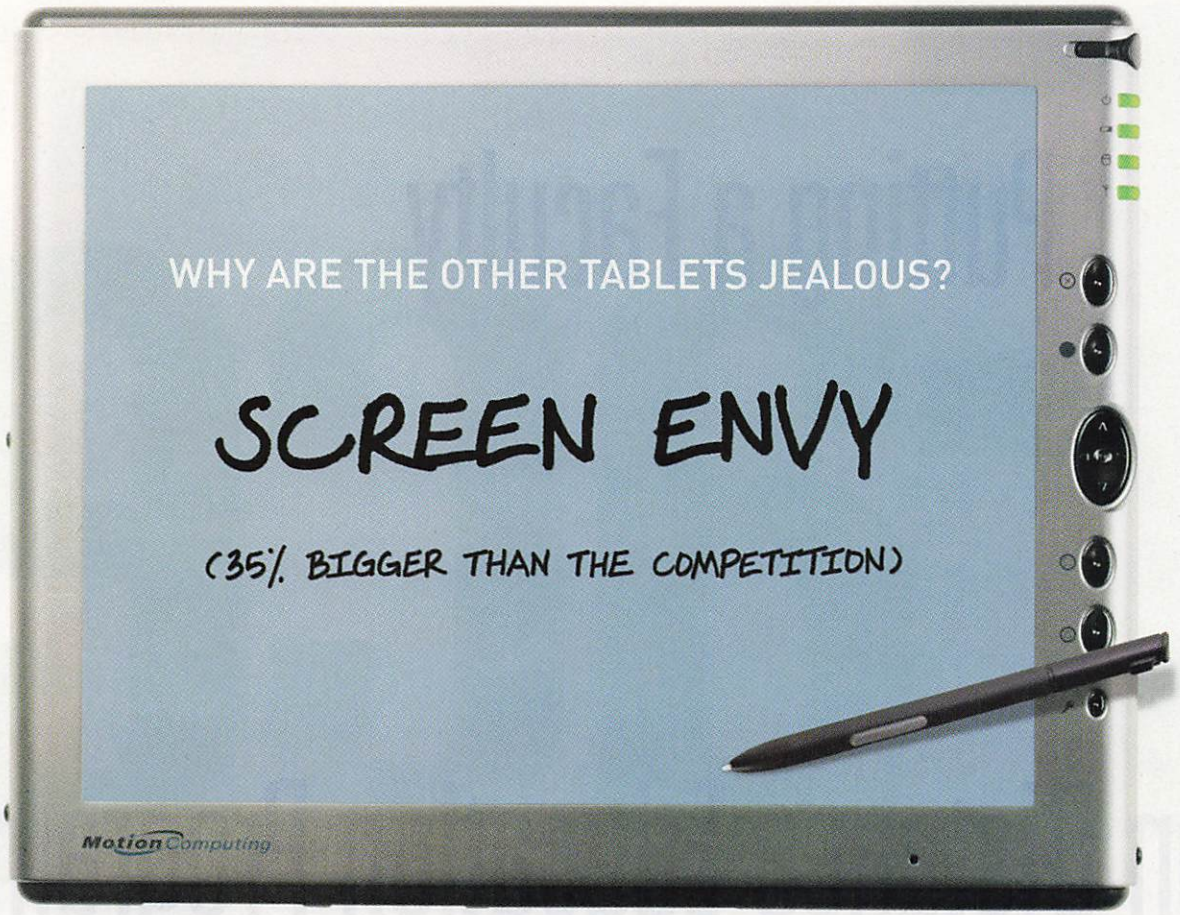
MacWorld

Apple introduced two new laptops at MacWorld, one aimed at filling the conspicuous absence in the lightweight portables (4.6 lbs) and one bringing to laptops an enormous 17-inch screen. Apple used the Austin Powers Mini Me character (Verne Troyer) and Yao Ming, the 7-foot center for the Houston Rockets to debut the new laptops side-by-side (www.apple.com/hardware/video). The new laptops add some nice ergonomic features—light-sensitive key illumination—with a bold bet on the direction for wireless (802.11g built-in, skipping 802.11a altogether).

More surprising was Apple's entrance into the browser arena with Safari. Optimized to run on Jaguar (Mac OS X 10.2x) Safari offers some new features. It can read a Web page aloud or automatically generate a summary of a recently viewed page. But the primary claim to fame from Safari is speed. Based on the open source Konqueror browser engine, a part of the K Desktop Environment, a graphical user interface that runs on Linux and Unix systems, Safari is leaner (smaller source code) and faster (both in start up and page loads) than anything yet introduced, at least according to Apple.

These are well-engineered and sophisticated laptops. Whether they are too little too late is the question for Apple. Some financial analysts appear to be non-plussed. The day of MacWorld, Merrill Lynch issued a sell recommendation. Almost simultaneously Prudential Financial issued a "hold" rating on Apple Computer. Looks like Wall St. is just as uncertain by the future of Apple as the rest of us. Sometimes the "8-ball" says, "Outlook cloudy, try again later."



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Putting a Faculty Face on Distance Education Programs

The distance learning process can be exciting and full of wonder—or it can be dull and lifeless. Which of these characteristics prevail depends on the ability of the faculty to design a program with which the students can and will interact.

By William H. Riffee
UNIVERSITY OF FLORIDA

Good distance learning programs can range from well-designed and well-written text to streaming video and accompanying media of various types. But media alone does not offer guidance and personal engagement. A blended or hybrid approach, using faculty facilitators or mentors, adds a human touch to distance learning. These faculty are not necessarily content experts, but facilitators or mentors who have a degree in the appropriate academic discipline. They participate with a physical presence, or in certain circumstances, a virtual presence.

I am fortunate to be associated with distance education programs that are very successful from the point of view of learning outcomes and that have been academically successful. It is my opinion that much of that success comes from using a hybrid model of distance education that involves the electronic delivery of content coupled with face-to-face contact by a faculty facilitator or mentor.

The Role of the Facilitator

The functions associated with facilitators have been categorized over the years. They include: facilitator, teacher, organizer, grader, mentor, role model, counselor, coach, supervisor, problem solver, and liaison.

In almost every program developed at the University of Florida, potential faculty facilitator/mentors have been identified in geographical regions located relatively close to cohorts of our distance learners. Regional activities occur, normally once a month, in which the facilitators meet face-to-face with students to carry out academic exercises that are designed to enhance the learning of the electronically delivered content. For example, the facilitators may review problem-based case studies

or critique student presentations.

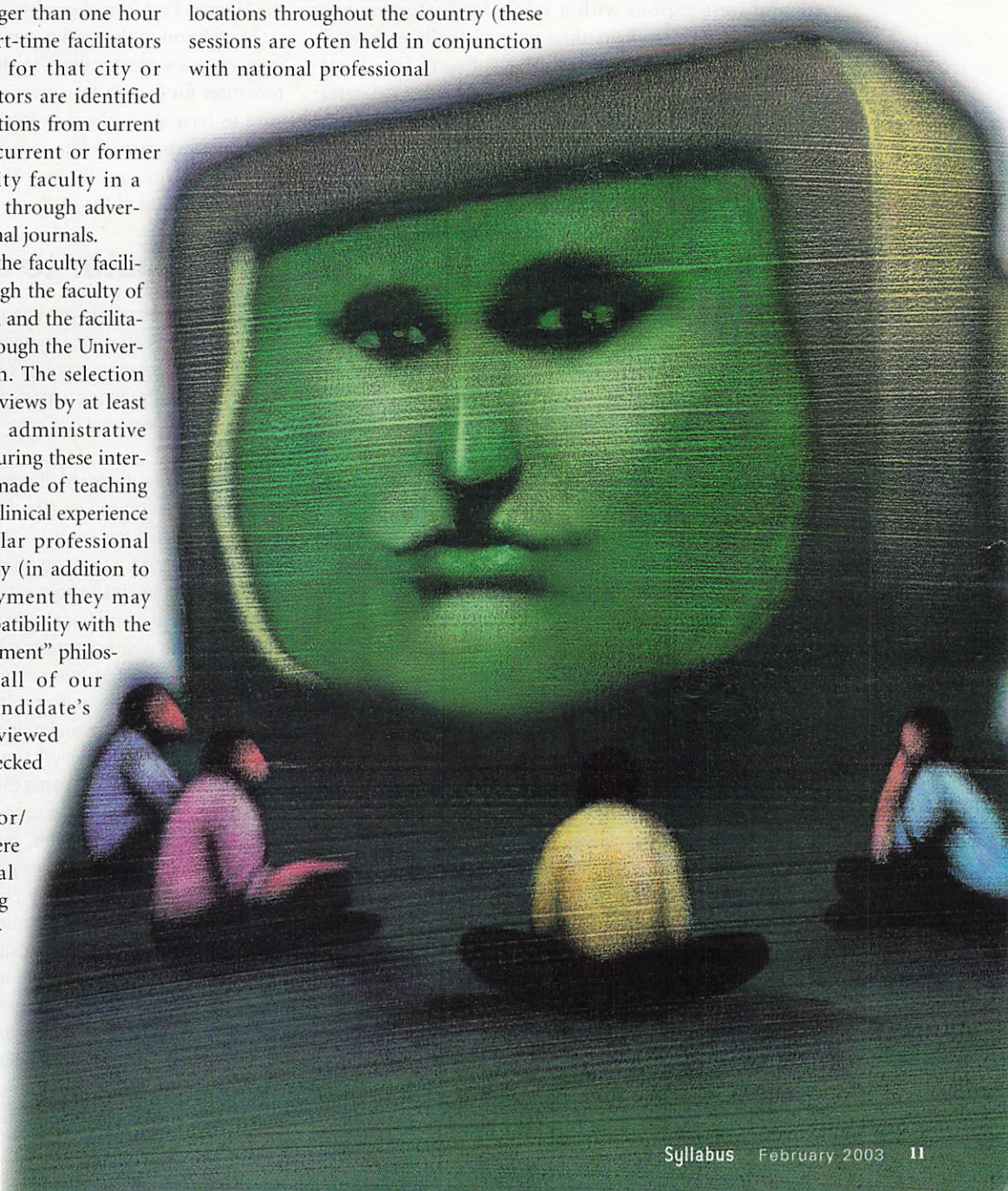
The most ideal ratio of distance students to facilitator/mentor faculty is approximately 12:1. If there are 36 students in a particular city or region of the country—defined as a distance that would require no longer than one hour drive time—three part-time facilitators would be recruited for that city or region. These facilitators are identified through recommendations from current or former students, current or former facilitators, university faculty in a particular locale, and through advertisements in professional journals.

The credentials of the faculty facilitators are vetted through the faculty of the home department, and the facilitators are appointed through the University Personnel System. The selection process involves interviews by at least two members of the administrative team of a program. During these interviews, assessment is made of teaching skills and experience, clinical experience (requisite in particular professional areas), time availability (in addition to the full-time employment they may now hold), and compatibility with the "safe learning environment" philosophy we hold for all of our programs. The candidate's curriculum vita is reviewed and references are checked thoroughly.

Once a facilitator/mentor is selected, there is a period of initial training involving several required components:

- Shadowing of a current facilitator/faculty member
- On-site (where the facilitator/mentor is located) training by an administrator of the program.
- Training at the university from which the program evolved
- Telephone conferences
- Required attendance at an annual training session held at several regional locations throughout the country (these sessions are often held in conjunction with national professional meetings that the facilitator faculty would be attending as part of their professional development)

The most obvious value of facilitator/mentor faculty is the addition of the human touch to far-flung distance



learning programs. It establishes a very valuable connection to the university and gives the learner a greater sense of intimacy with the program. In addition, if facilitators do their jobs properly, they can create a cohort relationship among their regional students or even spawn virtual cohorts of students.

Geographical Distances

In some cases, it is not possible to build a regional cohort due to the geographical distances among students. In those cases, the territory is divided into east and west regions with a single facilitator for each region. The students then meet virtually each week, using PlaceWare collaborative software (see PlaceWare.com) and a 1-800 conference call. (We determined that voice and data would be separated due to the fact that many of the students are located in geographical areas where high-speed Internet connections are not yet possible—we did not want to compromise the connections for either voice or data.) During these virtual sessions, the same types of exercises that would normally be carried out monthly during the regional face-to-face meetings are done once a week in virtual space.

Close facilitator/cohort relationships develop even in the virtual classroom model. In one notable example, a facilitator was having a hospital stay to deliver her baby, but was so engaged with the students in her cohort that she conducted the virtual meeting from her hospital room (see "The Facilitator: Adding the Human Factor to eLearning").

In addition to the weekly synchronous virtual meetings, once a semester these students and their facilitators meet for face-to-face meetings so that they will be sure to have direct human involvement during their academic experience. The meetings are held either in Las Vegas, Nev., or Tampa, Fla., depending on the regional location of the student.

The Facilitator: Adding the Human Factor to eLearning

Since 1999, Janet Dailey has been a group facilitator in the Working Professional Pharm.D. (WPPD) program at the College of Pharmacy at the University of Florida. As a facilitator, Dailey operates as a local faculty representative for the Florida-based program.

From her home in Huntsville, Ala., she fields e-mails and phone calls from area students on subjects ranging from case presentations to syllabus changes to upcoming administrative deadlines. Once a month she meets with students in an en masse face-to-face gathering to discuss the curriculum, hear concerns, and just rub elbows.

"The facilitator's role is to facilitate discussions to make sure that everyone stays on target with what we need to accomplish, answer questions, and point them to the right people," explains Dailey. "We are not the content experts in the particular type of subject that is being discussed but we certainly are at the forefront between the university and the student body."

In the role, Dailey works to bridge the learning gap that can sometimes open up between face-to-face programs and their distance learning counterparts. The most obvious of those is the loss of the immediate pedagogic rapport between teachers and students that even in large auditoriums can turn an ordinary lecture into an outlet for inspiration and discovery.

However, a warm personality and a clear personal commitment by the facilitator are intangibles that can often overcome even the thinnest ties between a student and their distance learning program. Dailey has proven dramatically that she possesses some of these qualities. For instance, she once conducted one of her weekly teleconferences with a group of regional students from her hospital bed after the birth of one of her children.

Dailey holds a doctor of pharmacy degree from the University of Nebraska and works part-time as a clinical pharmacist in a primary health care practice. Although she was a working pharmacist, she gravitated toward the facilitator role naturally. "I have always enjoyed teaching and I actually knew some of the administrators of the program; they came to me and asked me if I would be interested in doing this."

Since starting as a facilitator in 1999, "the biggest difference is the use of technology," she says. "That has changed tremendously." The Pharm.D. program is now about to move from using the Blackboard eLearning platform to a software suite from eCollege. Such platforms are a "lifeline" for students, as well as teachers and facilitators, Dailey says.

Overall, her experience has changed her initial skepticism about distance learning programs. "I think when I first started I always hesitated about distance programs," she explains. "But I have truly been impressed with the WPPD program, the level of material that's being discussed, and the expectations we have from our students. And I think that goes for them too."

Quality and Rewards

One of the first challenges for institutions contemplating the use of facilitator/mentor faculty in distance education programs is concern over the fact that the program has never done this before. It is new to the program and may be considered relatively "out of the box" thinking.

Can academic programs anticipating using a hybrid approach to distance education accept the concept that adjunct/part-time faculty can be located at regional sites and that those candidate faculty will meet the academic standards held by those on the home campus? The experience at the University of Florida has shown that there are, indeed, qualified faculty/facilitator faculty in many regions of the country who are interested in associating with academic institutions as part of distance learning programs. Quality facilitator/mentor faculty can be located who will be able to provide a solid base of personal interaction with distant learners.

The faculty selected to work on a regional basis embody a valued group of experienced professionals. It is necessary to compensate these professionals so that they feel they are being treated in a way that reflects their contributions to the program.

Compensation is calculated on the basis of the current salary for such a professional in the region where they are located. Time requirements are estimated based on past experience so that the facilitator faculty are compensated for the estimated time they spend with the program. Additional compensation, such as bonuses, is calculated based on the contribution above and beyond the expectations normally placed on them and is adjusted for the number of students being mentored.

A Now-Familiar Face

With appropriate orientation and training, facilitator/mentor faculty become invaluable assets to distance learning programs. The face-to-face opportunities to meet periodically help create an esprit de corps that adds value to the educational experience. Students in such hybrid programs develop an institutional loyalty and alumni relationships atypical of many distance education programs.

Those students who return to campus for graduation ceremonies spend hours at the university bookstore stocking up on university-related paraphernalia that reflects this established loyalty. The majority of distance students in University of Florida programs travel to our campus for commencement ceremonies—usually their only visit to the main campus and many times traveling considerable distances with family and friends to participate. In one case, the students and the faculty grew so close that as graduation approached, one of the students leased a Lear jet to transport the entire cohort and the facilitator to Gainesville, Fla., for the commencement ceremonies.

Traditionally, distance education has been developed as stand-alone Web-based programs with little interaction between faculty and students. The University of Florida has found that the addition of the facilitator/mentor faculty has brought a new dimension to distance-based programs, one that has improved overall quality. The additional academic experiences available to our distance education students have put a now-familiar face on our distance education programs.

At a Glance

Hybrid Distance Learning

Hybrid Distance Learning: A distance learning program using both electronic delivery and local facilitators or mentors to coach, counsel, and support students

Ideal Student/Facilitator Ratio: Approximately 12:1

Facilitator Traits: Teaching skills, clinical experience, time availability, compatible philosophy

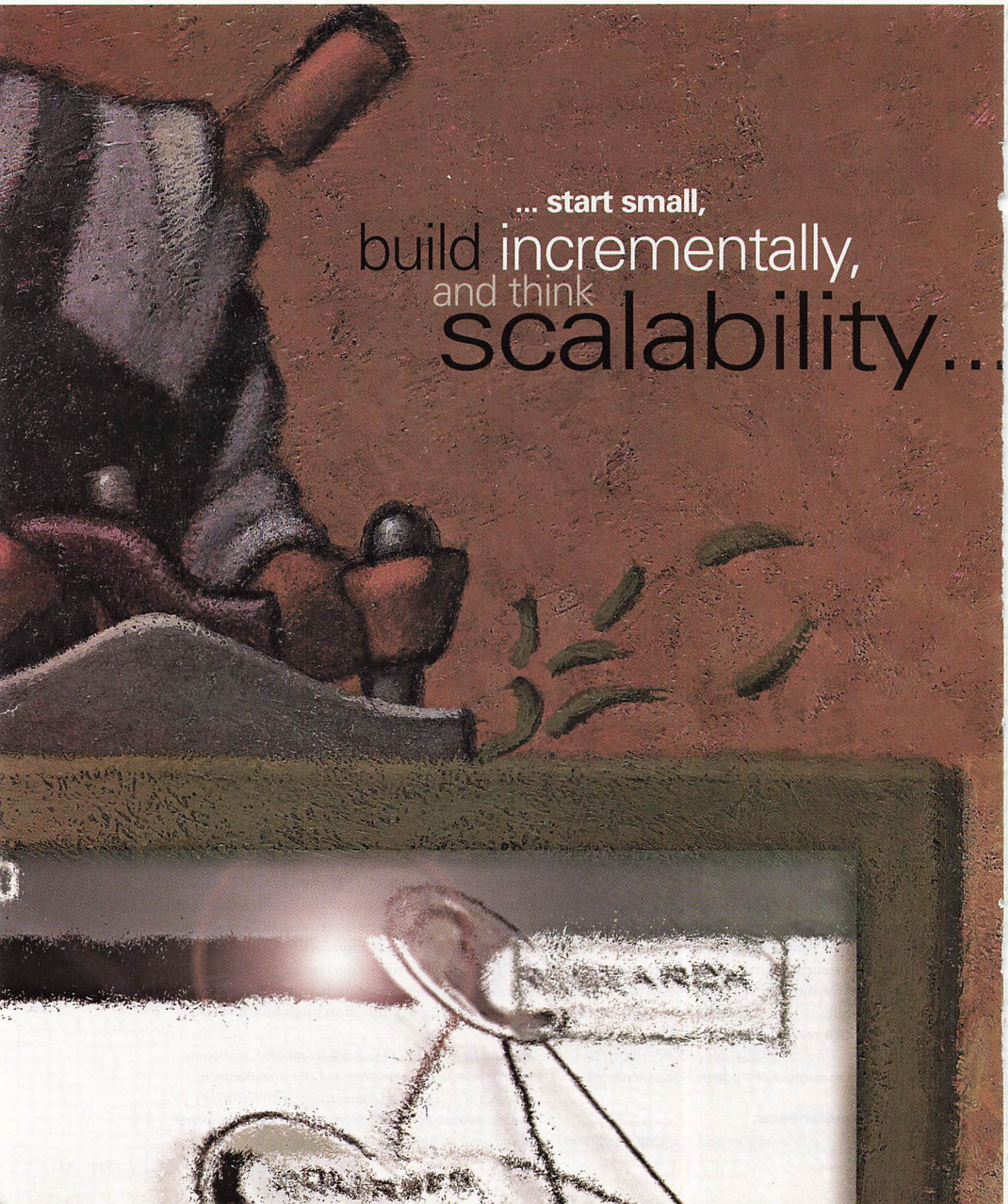
Facilitator Training: Training at host university, shadowing current faculty member, telephone conferences, annual training updates

Compensation: Level based on current salary for such a professional in the region where they are located

Quote: "Traditionally, distance education has been developed as stand-alone Web-based programs with little interaction between faculty and students other than through electronic means. The University of Florida has found that the addition of the facilitator/mentor faculty has brought a new dimension to distance-based programs, one that has improved overall quality. The additional academic experiences available to our distance education students have put a now-familiar face on our distance education programs."

—Bill Riffee

William H. Riffee, Ph.D. (riffee@dce.ufl.edu), is associate provost for distance, continuing, and executive education and dean of the College of Pharmacy at the University of Florida. ***Editor's note:*** *Bill will moderate a panel on distance education at Syllabus2003, July 27-31 in San Jose, Calif.*


... start small,
build incrementally,
and think
scalability...

The emergence of online education raises important considerations for faculty and administrators planning to develop distance education programs on their campuses. Here, two administrators share their six years of experience with a successful online initiative.

By Jacqueline Moloney and Steven Tello, UNIVERSITY OF MASSACHUSETTS-LOWELL

Principles for Building Success in Online Education

As higher education adminstrators, we faced numerous challenges beginning in 1996 when we launched our online efforts at UMass-Lowell. Which courses or programs to migrate, what faculty to involve, and which platform to use are just a few of the many complex decisions that institutions must confront in building online programs. To help others, we've created a rubric that covers five strategic areas of decision making:

- Selection of courses and programs
- Faculty development, support, and incentives
- Technology and infrastructure
- Redesign of student services
- Program and course evaluation

A set of four operating principles that evolved with the success of our program exist as important guides:

- Adhere to your campus mission
- Use traditional academic structures and faculty to accelerate the development of online education
- Start small, build incrementally, and think scalability
- Build learning communities that push the limits of new technology

Principles in Action

Consistent with the principles above, UMass-Lowell's online education program started very small, with a handful of pioneering faculty. Like many public universities, we were trying to identify new markets that could bring needed revenues to the campus and expand access to our programs. Therefore, the online program was initiated through the Division of Continuing, Corporate and Distance Education (CCDE) to address those campus needs. As a self-supporting organization, CCDE was to identify strategies that would generate sufficient revenues to cover program development and delivery costs. Working through decisions by employing the principles previously outlined, we were able to overcome the obstacles that often inhibit the growth of online education.

The online program at UMass-Lowell now offers six full degree programs and enrolls approximately 6,000 per year. It is one of the largest online programs in New England and is a major contributor to UMassOnline, the University of Massachusetts system-wide effort to provide online education. The program at Lowell is entirely self-supporting and returns significant revenues to the campus that seed continuous growth. Below, we examine some of our formative decisions in the five strategic areas, and consider the operating principles that guided our choices.

Selection of Courses and Programs

Because of the financial considerations mentioned above, we identified a process and set of criteria for selecting which programs to move online. First, the program had to have an established market. Second, the program had to have flexible requirements that would appeal to multiple audiences and be scalable. To address those criteria, we examined our potential markets and targeted adult learners who needed the flexibility and convenience of online education.

Illustrated by Rob Colvin

All of the courses we selected to migrate online had to fit into a certificate, and all the certificates had to fit into one of two undergraduate degrees designed for those seeking degree completion. Because we had a flourishing market in information technology, we focused our initial development there and gradually built out offerings in liberal arts, health, education, and engineering. The strategy proved successful as evidenced by consistently high enrollments in the courses and programs. For several years, the program averaged 100 percent growth, and it now continues to grow at approximately 25 percent annually.

Traditional faculty inform online course design. To ensure its alignment with the university mission, we purposefully engaged traditional, tenured faculty in the design of the online program. Rather than ignore their questions, we used their concerns to guide the design of the program. For example, the faculty were concerned about losing interaction with their students and about the potential for lowered standards. To address those concerns, we designed the courses to enhance interaction and uphold quality. As a result, our online courses mirror the design and quality of our face-to-face courses. The courses run in a traditional 15-week semester and class size is limited to 30 students. Each week, course lecture notes are released and students move through the course as a cohort, learning from each other, guided by the instructor. Courses are delivered asynchronously, so students and faculty log onto the course at anytime, from anywhere, and participate and interact through discussion boards and e-mail.

While there are numerous alternatives such as self-paced and competency-based learning, our online course design is consistent with the academic structure of our campus. More importantly, the design enabled the faculty to build interaction into their online courses, a critical concern for quality education. In this format, faculty and students report at least as much, if not more, interaction in their online courses as in their face-to-face courses. In fact, the traditional faculty are now champions of the online program and often serve as mentors to their colleagues.

Selecting a Course Management System

UMass-Lowell's criteria for selection of a CMS included the following:

- Installed on local equipment
- Based on an industry-standard relational database
- Allows access to any course or enrollment data through commercial, data query software
- Supports integration with other campus systems through commercially available scripting software
- Allows substitution of integrated components such as chat, discussion forums, and testing tools
- Provides a forms-based interface for the development of course materials as well as instructor course management
- Does not require specific software for student access or instructor course development
- Supports the integration of various multimedia and plug-in software modules
- Does not require a perpetual, per-seat license fee
- Vendor agrees to meet with us twice a year to discuss upgrades and modifications to the system

Faculty Development, Support, and Incentives

Teaching online requires faculty to transform their courses and related pedagogies. When we first began our faculty development efforts, we hosted several face-to-face workshops that consisted of approximately nine hours of training. Consistent with the principle to start small, and to think scalability, we gradually grew this initiative into a comprehensive program that supports faculty through four phases of development.

The first phase provides a 4-week online workshop where faculty learn to teach online by being online students themselves. This online seminar features important strategies of online teaching as well as hands-on experience with course management systems. In the second phase, faculty begin development of their online course materials and migrate their syllabus, lectures, and other course materials to the course management system, assisted by development staff and a second 4-week online seminar. The third phase of development occurs while the faculty teach their first course, and the fourth phase occurs as faculty redesign their courses to incorporate more sophisticated online strategies such as case studies and team projects.

A team of course developers and technical support staff work with the faculty throughout this process, assisting in course migration and materials development, ensuring each online course is complete before the start of each semester. With this model we can migrate approximately 40 new courses annually and support 250 course offerings efficiently and cost effectively. Our development team now offers a series of development modules for teaching online, on the Web, to our faculty, as well as those from colleges and universities across the country (http://continuinged.uml.edu/online/institutes.htm).

A key component to our success in building the online program is a system of intrinsic and extrinsic rewards that faculty receive for their participation. A detailed intellectual property agreement as well as course development stipends provide the extrinsic protection and renumeration agreed to by the faculty. As important, an extensive range of professional development opportunities provide faculty with the intrinsic rewards they appreciate.

Technology and Infrastructure

Making informed technology choices is key to a successful

online program. One of the most formidable decisions colleges face in the development of online programs is the selection of hardware and software for the delivery of their online program. The process can be intimidating, considering the many course management system (CMS) vendors, course publishers, and other companies, each claiming to offer the best solution for your campus. Our approach to selecting the appropriate hardware and software followed the principles outlined earlier in this article. The initial technology investment was relatively small, involving use of a Web server and list server already owned by the university. However, to expand the program beyond technology-savvy faculty and into more disciplines, we had to provide an easy-to-use system for both the development and teaching of online courses.

Consistent with the principles outlined earlier, we sought a vendor that would respect the experience that our faculty brought to the table to inform the development of new generations of the CMS product. The ideal course management system should facilitate interaction between students and faculty; provide for easy course development and management; and provide a robust, scalable system that supports 24x7 service. The willingness of our vendor, IntraLearn, to work with us in order to improve the utility of the software for our program has proven critical in supporting the growth of our online program.

Redesign of Student Services

Before we launched our online program, students typically registered for courses by telephone or in person, and all administrative processes required an original, hard copy student signature. Course schedules, program descriptions, academic policies, and other program-related materials were printed and snail-mailed to students. Very early in the process, it became clear that we had to redesign the culture of our student services division to support online students.

Rather than announcing and implementing a large-scale redesign effort, our initial redesign work simply focused on forms and information. We asked the question, "If I lived on the opposite side of the country, how would I apply to a degree program? Drop a course? Talk to an advisor?" This approach was practical, non-threatening, and allowed student service staff to help develop solutions to the challenges raised by having online students.

Moving beyond online forms and information, we also recognized the unique needs of online students. Participation in an online course requires that students have a minimal technical aptitude and sense of themselves as a learner. Technical staff partnered with student service staff to provide both face-to-face orientation sessions and online orientation programs that detailed both technical and pedagogical considerations for students taking online courses. Most recently, staff have developed an online assessment that allows students to complete a brief online quiz that examines their technical knowledge, learning style, and ability to manage time—all factors that appear to contribute to student success in online education.

Program and Course Evaluation

From the outset, we established clear benchmarks so that the administration and faculty could assess the viability of the program. First, we established the principle that faculty and student experiences should be rated equal or better than the on-campus experience. An online evaluation process was implemented that examined student perspectives regarding the quality of course materials, instruction, student services, and technical services.

The results of the student evaluations are reviewed at the course and program level in an effort to identify the strengths and weaknesses of the program. This annual open discussion with online faculty regarding the online students' experiences provides an opportunity to discuss strategies for improving the online program. Several changes implemented as a result of this survey process and discussion include the expansion of technical support hours, the option of using multiple discussion and chat tools by faculty, the development of online faculty training, and modification of the CMS.

In addition to examining student perceptions regarding the quality of our online program, we also examine course and program persistence rates each semester. Another important benchmark has been the percentage of full-time, tenured faculty who have supported the growth and scholarship of our online program. The faculty development programs previously described have resulted in a steady increase of the percentage of tenured faculty teaching in our online program, to 35 percent of all instructors.

While we have developed internal metrics for establishing the quality of our students' online learning experiences, colleges and universities must remain cognizant of regional and professional accreditation standards that provide external mechanisms for monitoring the quality of higher education. Accreditation standards for online education require campuses to provide the same levels of assurance currently required of on-campus programs, and we track our progress toward those standards accordingly.

Challenges for the Future

Enrollment trends point to the need for accelerated integration of online education; yet some colleges and many faculty have yet to engage in this important opportunity. To move forward, institutions must chart a strategy that will best suit their campus mission. One of the strengths of American higher education is its relentless pursuit of opportunities that will enhance the educational experiences of our students and faculty. To continue that pursuit requires that we take hold of this new frontier and drive the technology so that we maximize opportunities to improve teaching and learning.

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Sally M. Johnstone

As founding director of the Western Cooperative for Educational Telecommunications (WCET) at the Western Interstate Commission for Higher Education (WICHE), Sally Johnstone serves as a resource on higher education technology issues. She also serves on the Board of the American Association of Higher Education, the U.S. Open University's Board of Governors, and the Advisory Panel for the Consortium for the Advancement of Private Higher Education.
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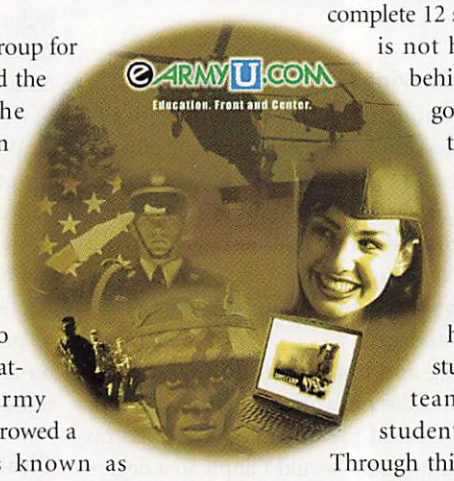
An Army of Distance Learners

One of the largest collaborative distance learning activities operating right now is the eArmy University. It began enrolling students two years ago and they now have had over 50,000 enrollments. A group of colleges and universities each offer their own individual degree or certificate programs but many of the student support services are offered through a portal created and managed by a team within IBM Corp. The eArmy U management team used to be a part of PwC Consulting, but with the late unpleasantness involving accounting firms and their consulting activities, IBM was able to purchase them.



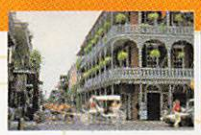
I serve on an advisory group for the eArmy U and have had the opportunity to watch the progress of the organization as it grows. The students are soldiers who may be almost anywhere in the world signing on to their class. This has posed some interesting challenges. To serve these diverse and scattered students, the eArmy management team has borrowed a concept from business known as Customer Relationship Management or CRM. The eArmy U's CRM system/database is available to all those who serve students. If a student has a technical problem and contacts the Help Desk, the person there records the nature of the problem and the steps taken to reach a solution in the CRM database.

He or she also can see whether the student is "on pace" in current courses or in the program in general. If the student is not on pace, the Help Desk person can suggest an intervention. If the student needs tutoring, he or she is referred to Smarthinking, an online tutoring company. If the student needs to find an appropriate course in which to enroll, he or she is put in touch with an advisor. On the other hand, if an advisor discovers a student is having technical problems, the student can be connected to the Help Desk.

All these interactions are tracked and the next person with whom the student is in contact does not have to ask the student to tell his or her story again. Since implementing this CRM system, the IBM team reports the speed of problem resolution has increased dramatically.

Retention is a problem that all institutions face that seems more difficult to manage in online courses and programs. This was true for the eArmy University as well. The soldiers who choose to participate in the eArmy U agree to complete 12 semester hours each year. It is not hard for a student to fall behind in trying to reach that goal. To help students stay on track, the management team launched Operation Eagle. The Eagle Team members became mentors for students who are not on pace to meet their 12-hour credit goal. When a student is identified, an Eagle team member contacts that student by phone or by e-mail. Through this simple intervention, just under half of these at-risk students enrolled in courses to get them back on pace.

While none of these systems are unheard of in higher education, what is unique about eArmy U's activities is the scale and scope. The rapid scaling of the system to support students is interesting: Enrollments in eArmy U went from 0 to 50,000 in two years. That's impressive in any educational activity. The management team runs the support system for all eArmy U students regardless of the institution in which they are enrolled. The accomplishments and strategies of the management system probably have more import for a statewide system than for most single campuses. There may be lessons here for state planners in the current budget-cutting environment.



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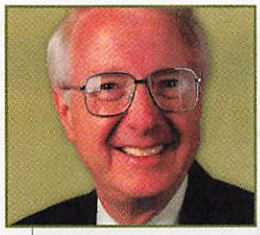


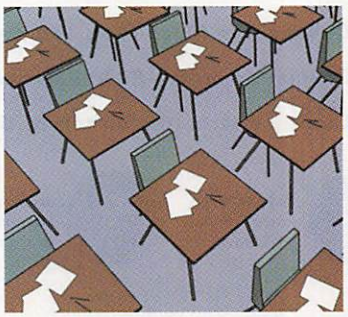
How to Customize Big Classes

David G. Brown

David Brown is vice president and dean of the International Center for Computer Enhanced Learning. He has served as president of Transylvania University, chancellor of the University of North Carolina at Asheville, and chair of several national groups, including the AAHE and the Higher Education Colloquium. As provost of Wake Forest University, he founded the Annual Conference of Ubiquitous Computing Colleges and Universities, and founded the Journal of Computer Enhanced Learning. brown@wfu.edu

I'm often challenged to suggest ways to use technology in really large classes of 60 and 200 and 600 students. In practice, I believe that the potential for value added by computers is even greater in larger classes.

Consider these two points: First, computers enable and support interpersonal communication, exchange of information, timely dialogue, and collaborations; second, computers make feasible customizing assignments, differentiating the experiences of shoulder-to-shoulder learners, and individualizing learning opportunities. There are other benefits that come from adopting the computer, but the highest benefit/ lowest cost use of the computer—to enhance communication—is also the most supportive of learning. And it is in larger classes where the potential for increasing customized communication is the greatest.



However, before most of these benefits can be realized it's necessary to work through one issue: computer access, or more specifically, regular access to the Internet.

From the outset, usually in the course syllabus that's distributed at the first session, all students should be told that they must check their e-mail daily and that they must be able to access course materials on the Internet. In other words, all teaching in this course will proceed on the assumption that students own the textbook, that students have access to the library and laboratory at appropriate times, that students come to most classes, that quizzes and exams will be taken when scheduled, and that students have daily access to the Internet. It may not be equally convenient for every student to reach the Internet every day, just as different students will face unique challenges in getting to the library and even to class. But the difficulties encountered by a few will not be permitted to deny the opportunities provided by computers for the many.

If a particular student finds this eminently reasonable condition too onerous, that student should enroll in another section or not take the course. In order to avoid confusion and professorial double-work, it is essential that all students be party to the computer-based communication system around which the course is built. With two-thirds of American households, 75 percent of American college students, every college's computer lab, and almost every public library now connected to the Internet, the presumption of universal access is not only necessary, it's also reasonable.

Once the Internet is thought of as a learning tool available to all, big classes can be enhanced by four strategies: delegate, communicate, collaborate, and customize.

Delegate

Ask your large corps of students to help each other learn by:

Register for Syllabus Forums!

To register for David Brown's Faculty Best Practices Forum, go to www.syllabus.com, click on Community, and then select the Forums link. The Forums page will list the Faculty Practice discussion, as well as other Syllabus Forums on eCommerce and Entrepreneurship on Campus, Faculty Development, and eLearning Systems.

At the top of the listed Forums is a Register button (located next to the Login, Active Topics, Search, and Members buttons). Clicking on the Register button will take you to the Forum rules and policies. If you agree to these, click on the Accept button at the bottom of the page. Next, you will be asked to fill out a short form. The only required information is a username and password; the other information is about your personal preferences for how you would like to participate. Once you've completed this step, you will be a registered Syllabus Forums user, where you can interact with your peers and moderators in the Forums of your choice!

- Identifying and sharing URLs that support learning the material in different ways.
- Refining each others' rough draft papers or answers to end-of-the-chapter questions.
- Accepting periodic designation as "captain of a 10-student group" for the week and, in the role of captain, consolidate student questions and answers and make sure that every student in the group leaves the week with an understanding of the material.
- Identifying, during the end of the term, those students who were most helpful to them.

Communicate

- Establish a daily deadline for checking e-mail.
- Use an electronic grade book (with periodic backups in hard copy).
- Build a frequently-asked-questions file that can be improved with each course iteration.
- Design team assignments that can (if necessary) be worked on asynchronously.

Collaborate

- Watch for teaching-with-technology sessions at national disciplinary meetings.
- Make a deal with several colleagues to develop interactive materials for one week of assignments in exchange for their developing materials for other topics and weeks.
- Check MERLOT at www.merlot.org for chunks of material.
- Check out the National Gallery of Courses Taught with Technology at http://iccel.wfu.edu/gallery.

Customize

- Ask each student to complete a short profile-of-interests form, including a picture, and place the material on the course Internet site.
- Once or twice during the term, after consulting the profile, send a short e-mail note to each student.
- In class, ask students to wear nametags and establish a fixed seating pattern. If feasible, create a seating chart with pictures and names; send an electronic copy of the chart to all students.
- Provide the URLs for alternative ways of learning the material, and for examples of the use of the material that relate to different interests.
- If feasible, establish a hierarchy of help whereby a student's question (often delivered via e-mail) can first be addressed by classmates, then a paid undergraduate advisor to the course, then a graduate assistant, then an assistant professor, and finally (if not yet answered) to the full professor in charge of the course.

Many of these activities are natural elements of small courses, but the technology allows us to consider pursuing these same strategies when larger numbers of students are involved. Because of large numbers, larger up-front investments of time can be justified.

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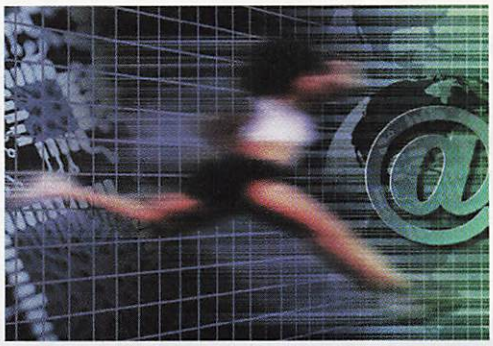
Education, Technology, and the Human Spirit

Steven W. Gilbert

Steven Gilbert joined the American Association for Higher Education (AAHE) as Director, Technology Projects, in July 1993. He founded the TLT Group as the Teaching, Learning, and Technology Affiliate of AAHE in January 1998. He was previously vice president of EDUCOM, where he created and led the Educational Uses of Information Technology (EUIT) program and the EDUCOM Software Initiative (ESI). He also moderates the Internet listserv AAHESGIT.
gilbert@tltgroup.org

"Education, technology, and the human spirit" is a phrase that might be confusing to those who fear that these three elements cannot fit together well at all. They see technology as an irreversible force driving education to become ever more mechanistic, impersonal, and divorced from important community and societal values.



Others see technology as supporting education that can be more individualized, personal, and nurturing of communities and of the human spirit. They may recognize this phrase as a doorway into a new place—a place where they can continue building something worthwhile together.

But information technology can also be the excuse and the means to new goals, new accomplishments, and new visions in education. As we see more clearly that education is changing in response to new technology, we also see that we can make choices. Will we allow technology to change education and to change us—in ways that we do not predict and may not prefer? Or will we make decisions and commitments to use technology to enable the kinds of change that matter most to us?

Many people already seek to understand and improve the human condition that underlies any educational activity. And some recognize and try to improve the spiritual dimension of education—one that might be deeply hidden, actively denied, or set aside as irrelevant or inappropriate. Many of the people making these efforts rarely talk to each other or even acknowledge each others' existence, legitimacy, achievements, and goals.

During the past seven years I have helped hundreds of groups use several "Fundamental Questions" as they consider changes brought on by new choices for information technology in teaching and learning. The conversations that result often help the participants understand more clearly what is really important to achieve in technology-supported education. More recently, we've begun to suggest the following steps:

Think about some examples of teaching and learning you have appreciated in your own experience. Think about the changes in education that now seem possible or unavoidable. As you recall these instances consider the possibilities of change you are now facing:

1. What do you most want to gain?
2. What do you cherish and most want not to lose?
3. What or whom are you thankful for?
4. How can information technology help/hinder what matters most to you?

As you explore your answers to these questions, list specific ways of using information technology to effectively link education, technology, and the human spirit. These questions can be even more stimulating when asked in a way that encourages you and your colleagues to consider not only your professional goals, but also your deeper personal aspirations. I expect that in these new conversations we will understand much better what people mean by the "human spirit." As that becomes clearer, I hope it will also become more influential.

RESOURCES

- **www.tltgroup.org/Queries/7FundamentalQuestions10-10-01.htm**
- **www.tltgroup.org/Queries/Connected.htm**
- **www.tltgroup.org/ETHS.htm**

Education, Technology, and the Human Spirit Success Stories

Blind Teacher, Deaf Student
Norm Coombs, a blind history professor (emeritus) at Rochester Institute of Technology, reports that electronic mail has enabled him to develop effective teaching/learning relationships with some of his students who had certain characteristics that made it unlikely to happen otherwise. For example, he describes a deaf student with whom he learned to communicate at a distance and in his own office. In the office, Coombs typed his ideas into his computer which displayed the results in large characters—easy for the student to see and read. The student could type her ideas into the computer and software converted her text into audible speech—easy for Coombs to hear and understand.

Undergraduate Success Story
An undergraduate leader in a highly structured and successful Student Technology Assistant Program began her first encounters with no self-confidence and frequent self-deprecating comments. During the next two years, she discovered her own ability to fix technology problems and help others gently, respectfully, and authoritatively. She earned the respect of her student colleagues, faculty members, and technology professionals. Instead of dropping out, she opted to continue her studies beyond what was needed for her bachelor's degree—long enough to fulfill her hopes of becoming the top student manager for the entire program.

Unsuccessful Tele-personality
A tenured professor received top marks in student evaluations for many years. He agreed to teach one of his favorite courses via two-way video teleconference for a group of students at a satellite facility. He delivered the same lectures and asked many of the same questions he had been using successfully in the past. But he wasn't getting the kind of active participation he had enjoyed from his students in the classroom; the student ratings of this new course were very low. The structure of the teleconference cut out the informal time that had been supporting his face-to-face sessions: arriving early and staying late, sharing stories relevant to the subject matter.

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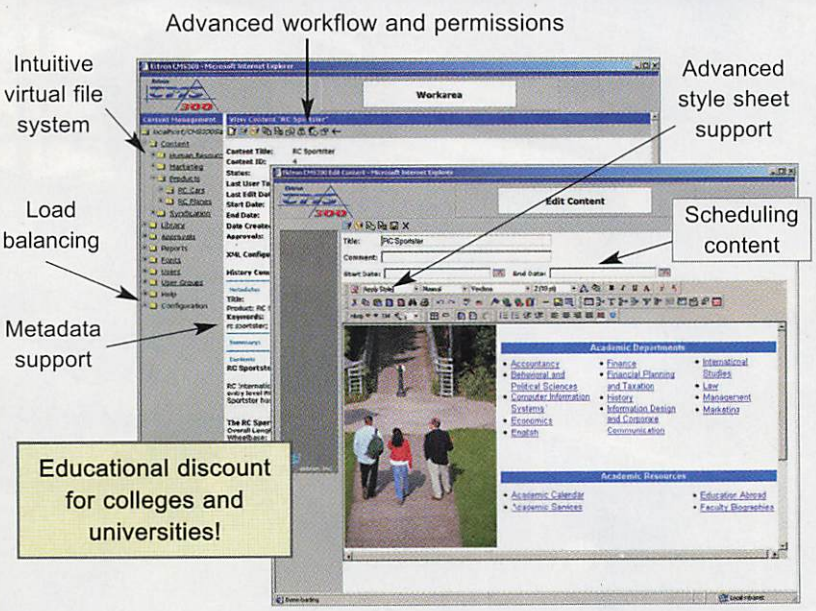

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- **Advanced content management** functionality
- **100% browser-based**
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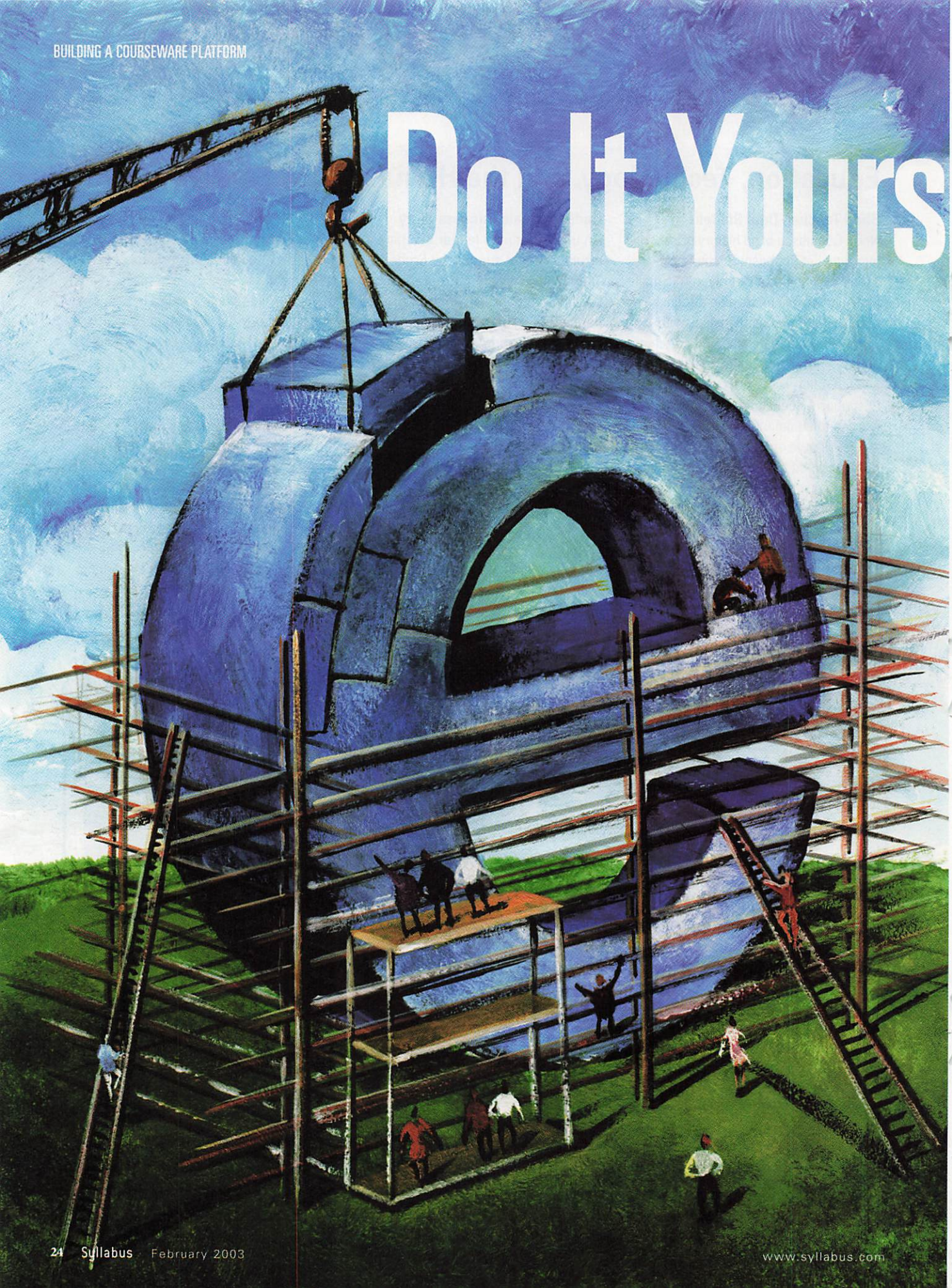


elf Courseware

HOW WE BUILT A REUSABLE WEB PLATFORM FOR STUDYING WORLD CULTURES

Rudolph Bell and Ronald Jantz
RUTGERS UNIVERSITY

Given the increasing proliferation of non-scholarly information on the Web, a great demand exists for tools that can help students rapidly sort good information from bad in pursuing undergraduate studies. However, many academic departments are not equipped to design course Web sites that require some programming and the use of more complex technology.

The Rutgers University History Department and the Scholarly Communication Center (SCC) of Rutgers University Libraries have been experimenting with platforms in which more complex and functionally sophisticated Web-database technology can be reused by designing generic software functions and a generic database as part of the overall architecture.

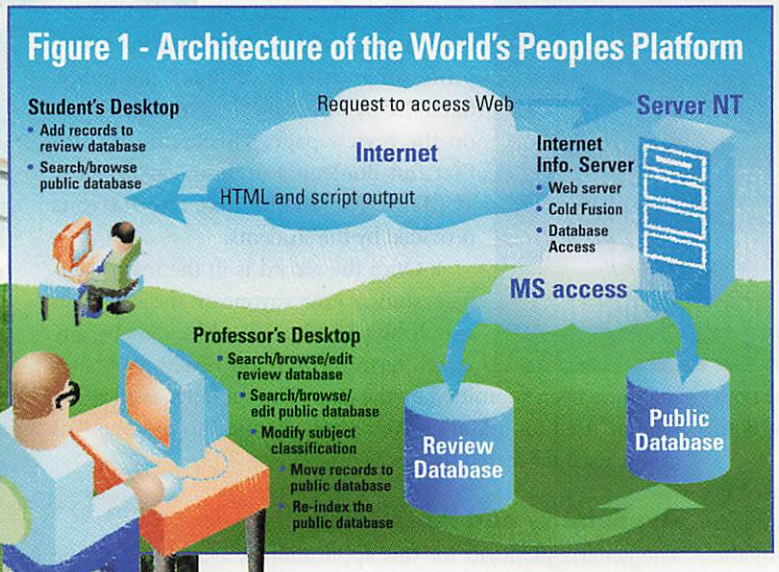


Figure 1 - Architecture of the World's Peoples Platform

Infographic by Susan Morrison

Illustrated by Illustration Works

We developed a platform for collecting and cataloging Web sites for an undergraduate course on the culture and history of Italy. For this type of course, there is a wealth of historical information on the Web that can be used in a classroom setting. However, students have difficulty finding the content, evaluating it, and using it effectively in their studies. The Italy's Peoples course provided both a pedagogical and technological framework to assist the students in this process.

The technology framework, or platform, for Italy's Peoples has been generalized so that it can easily be customized without programming knowledge for any group of people to be studied. A completely operational platform can be downloaded from the SCC Web site by those who are interested in using the technology for a similar course or application.

The Course

As part of the course in Italy's Peoples, the students were assigned an Internet project (15 percent of the course) in which they would collect Web sites that deal with the culture and history of Italy. The students typically used popular search engines such as Google or AltaVista to find appropriate Web sites, although they could also use online catalogs such as OCLC's WorldCat. The students were required to find quality sites that would increase their understanding of the subject while also enhancing their Internet searching skills.

The Italy's Peoples course has been offered twice at Rutgers by Professor Rudolph Bell of the History Department. He also offered the course a third time in the Fall of 2002 while serving as a visiting professor at the University of Colorado. In these three courses, over 500 Web sites were collected, reviewed, and annotated. The site and the collection are at www.scc.rutgers.edu/italy'speoples.

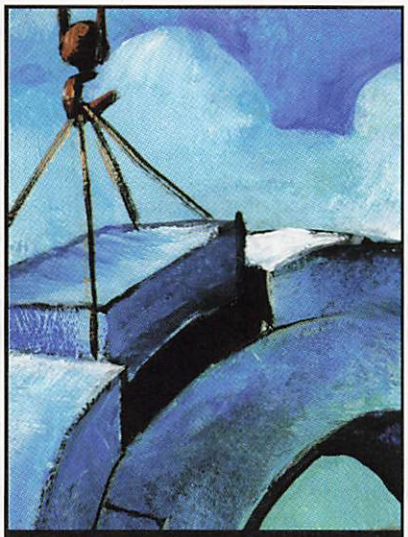
The Technology and the Platform

The SCC is a technology-based Center within the Rutgers University Library that is developing innovative approaches to learning, teaching, and digital access through several diverse partnerships and projects. Professor Bell and the SCC Data Librarian, Ronald Jantz, developed an architecture for the Web site that

has three major components: 1) "Add a Web site" for students to classify their Web sites and enter the associated record into the review database; 2) a capability to search and browse the public database; and 3) an administrative subsystem for the professor to view, evaluate, and approve student Web sites submitted to the review database. Once approved the professor can move the records to the public database.

In developing the platform for Italy's Peoples, we used Macromedia's ColdFusion product (a middleware scripting tool) and Microsoft's MS-Access for the database. The major components of the system are depicted in Figure 1.

The capabilities of the system have been generalized and incorporated in a working platform available at www.scc.rutgers.edu/scchome/technical/platform/wp_platform.htm. All references to a specific course, institution, or professor have been parameterized and represented as "include" files in the basic Web site. These files are used to display the following information on the Web: 1) title of Web site; 2) front page image and image citation; 3) introductory text for the Web site; 4) professor's name and e-mail; and 5) credits and acknowledgments. These five files are correspondingly labeled and can be easily edited with standard word processors in order to customize the site.



Quality issues will always occur, given the different perspectives of professors, librarians, and students.

Databases and Subject Classification

As shown in Figure 1, there are two MS-Access databases, a review database and a public database. Both contain an identical table labeled "Web sites." The "Web sites" table contains bibliographic information for each Web site that is submitted by a student. Typical fields in this table include the site name, site URL, subject classification, and contributor. In addition, the public database contains a table labeled "Subjects," which is used to describe both the subject classification system and the screen layout for both adding Web sites and searching the public database.

Figure 2 shows a portion of the screen layout that is used in the site for World's Peoples. To create or modify the subject classification system, the instructor will only need to specify the major and minor subject areas and the column in which they appear. Editing the subject classification scheme can be readily accomplished by selecting the Instructor's page ("Instructor" on the navigation bar of the World's Peoples home page).

The Process

After installation of the Web site and database is complete (see section on "Availability and Installation"), the professor can introduce students to the Web site and the basic capabilities. The following are the essential steps:

1. Students find and select Web sites (using a Web search engine) and classify these Web sites according to pre-selected subject areas. Figure 2 shows a portion of the screen image that students use for subject classification. The student will also annotate each Web site to not only clarify the content, but to add additional free text terms to improve recall of the records when searching and browsing the public database.

2. The student submits each Web site with subject classification and textual descriptions to the professor's review database.

3. The professor uses the administrative capabilities of the platform to review, evaluate, and edit the student-submitted records. In Professor Bell's experience with teaching the Italy's Peoples course, he found that a majority of the records required editing in order to provide consistency of classification. For example, a student might select a URL that dealt with Galileo (www.newadvent.org/cathen/06342b.htm), which was found in the Catholic Encyclopedia (www.newadvent.org/cathen). In this case, Professor Bell might suggest that the more general source (the encyclopedia) be selected with proper annotation to note the article on Galileo. Once edited and approved, the professor will move the appropriate records to the public database. This action automatically deletes the record from the review database. The professor must also re-index the public database by selecting the "re-index" link on the review page. This action insures that full Boolean searching capability is available for all the text annotations provided by the students.

4. Once the record is in the main database, students (or anyone on the Web) can search by pre-selected subjects or by any search term to find and review Web sites that have been submitted by the class. The subject classification scheme used for adding a Web site is identical to the one that can be used for searching (see Figure 2).

Availability and Installation

The generic platform for this application is available as a free download from the SCC Web site at www.scc.rutgers.edu/scchome/technical/platform/wp_platform.htm.

Once the file has been downloaded and unzipped it can be installed "as is" in the Web root of an NT server running Microsoft's Internet Information Server and ColdFusion Server 4.0 (or higher). The public database and the review database are MS-Access databases that are identical in definition, with one table labeled "Web sites," which contains all the bibliographic information for each Web site selected. These

two databases should be administered as ODBC sources using the ColdFusion Administrator.

In addition, a Verity collection should be created and the database indexed via the professor's administrative interface. In the platform, the public database is populated with a selection of records from the Italy's Peoples course so that prospective users can test out the site by searching and browsing some of the records. To customize the Web site for a particular course, the NT administrator, working with the course instructor, would only need to copy the site, rename the Web appropriately, and modify the five files as discussed above. No programming or knowledge of ColdFusion is required. A readme file providing detailed installation instructions is included in the Web root.

Reusable Software

In the software industry, platforms are considered one of a class of reusable software entities including objects, subroutines, code segments, and complete systems. Platforms typically are operational subsystems that provide complete functionality and require small modifications or additions in order to customize the platform for a particular application. One frequently finds the platform concept in other industries such as automobile manufacturing in which the same engine or chassis is used across many different models. This type of reuse can dramatically improve quality and reduce the time and complexity of creating products to satisfy different types of markets.

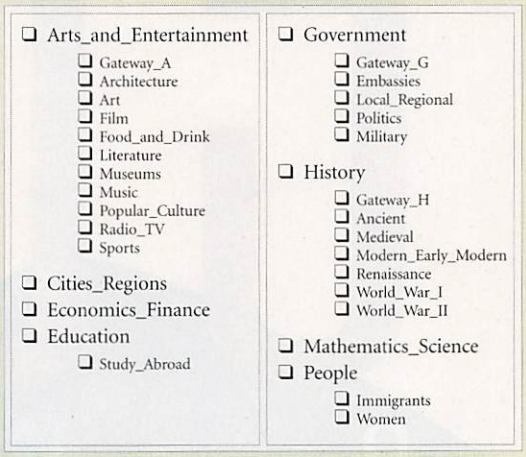
Probably the most difficult aspect in the initial design of this platform was the subject classification system. In the first offering of the Italy's Peoples course, we did not use a prescribed system as shown in Figure 2. In effect, the students' Web sites were classified by the text annotations they included as part of the description of the Web site. We found that this approach led to widely varying approaches by the students and, as a result, very inconsistent and unreliable search capabilities.

In the second offering of the course, the team of Professor Bell, Ronald Jantz, and Brendan Banks spent considerable time discussing different approaches to subject classification. Our primary criteria was that the classification scheme had to be broad enough to cover all likely scholarly subjects to be encountered on the Web regarding the subject of Italian history and the culture of its peoples. A second and a somewhat conflicting criterion was providing an uncomplicated scheme that could be readily mastered by undergraduate students in a single-semester course.

We ultimately devised a two-level system consisting of 12 major subject categories and allowing the possibility that each major category might have perhaps as many as 10 or 15 minor categories. Our final constraint was one of user interface design in which we wanted to be able to present the complete classification scheme on a page that would generally fit on a computer screen without scrolling. In the second offering of the course, Professor Bell required the students to use this new approach to re-classify some 400 Web sites that had been developed in the previous course. The initial classification scheme underwent further refinement as students classified each Web site. At this point, we feel that the subject classification scheme is reasonably stable although we do expect that additional subject areas will be added in future courses.

Figure 2 - Subject Classification

When students find and select Web sites, they will classify them according to pre-selected subject areas. Below is a portion of the screen image that students use for this subject classification.



In evaluating Web sites, the professor will typically encounter a problem with what we have called "gateway" sites. These sites offer a variety of information and could be submitted as one URL or the student might submit many of the lower level URLs separately. To help address this problem, we have included "gateway" as a minor subject heading under some of the major categories. For example, in Figure 2, the reader can see categories of "history—gateway" and "government—gateway."

Quality issues will always occur, given the different perspectives of professors, librarians, and students. Our subject classification system was created to emphasize scholarly aspects, although students frequently preferred some of the more practical Web sites that dealt with entertainment and transportation. What to include is one of the more interesting aspects of incorporating the Web in scholarly communication. In teaching a course like Italy's Peoples, the professor has an opportunity to help students understand the type of information available on the Web and how it may be used to further a student's education.

We encourage our readers to view the Italy's Peoples Web site or to download the operational Web site platform at www.scc.rutgers.edu/scchome/technical/platform/wp_platform.htm. If you decide to you use this platform, we would like to have your feedback and suggestions and an acknowledgement of your use.

Rudolph Bell (rbell@rci.rutgers.edu) *is Professor of History at Rutgers University.* ***Ronald Jantz (rjantz@rci.rutgers.edu)*** *is the Social Sciences Data Librarian at Alexander Library, Rutgers University. Brendan Banks is a graduate student at the Rutgers University School of Communication, Information, and Library Studies.*

Not Just Another pretty Course Web Site

Michael Collura
PURDUE UNIVERSITY

About three years ago, our department head challenged our faculty to develop a Web site for each and every course they teach. The rationale was that students need support for what happens in the classroom and the Web could be the most flexible and efficient way to do that. The Web allows us to relay important announcements to our students through, for example, e-mail, an electronic bulletin board, and even something as simple as a pop-up message. It also serves as a distribution point for materials, such as instructional supplements, assignment handouts, or presentations.

Now our department head wasn't irrational. He knew that the faculty couldn't—or wouldn't—meet this challenge without support. We began to tirelessly develop static Web pages for each course. Subsequently we trained support

staff—typically secretaries and/or graduate/student assistants—in basic Web page editing so that they could make the necessary updates. Realizing the tediousness and inefficiency of this task and knowing that developing static Web content was fast becoming an obsolete strategy, these practices didn't last long.

At the time, one of our alternatives was to use a well-known course management system that was available throughout campus. However, a number of the faculty had attempted to use it in the past and weren't pleased with its options, functionality, or reliability. Furthermore, we had little control over the system at the departmental level. This inspired the in-house development of our own system. The end product of this development has been in operation for over a year now, and early feedback has been very positive. Let me mention that the term "system" suggests the development of an elaborate monstrosity. On the contrary, our "system" merely uses common, run-of-the-mill Web technologies.

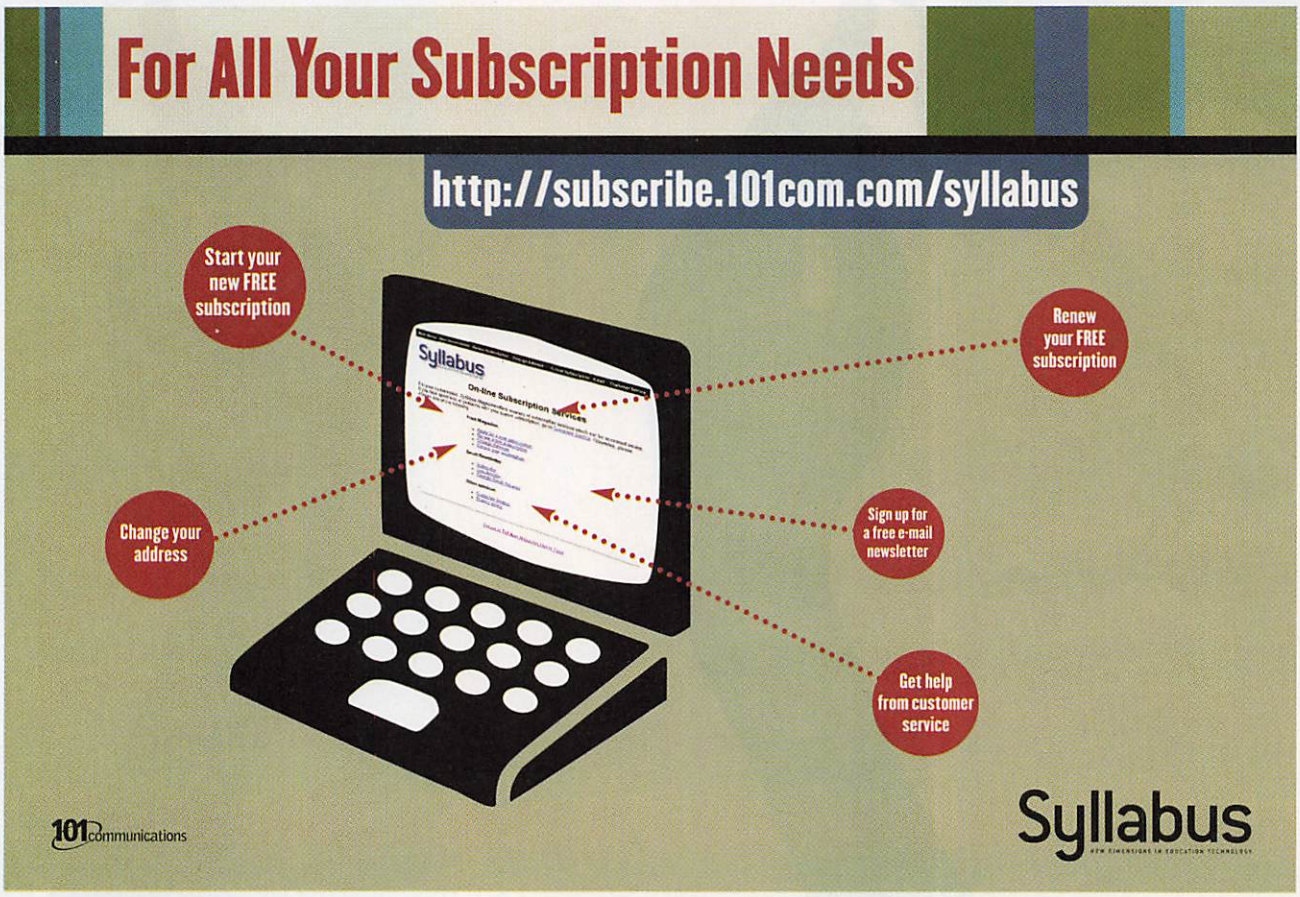
The system uses Active Server Pages to create dynamic Web sites. Data needed to create a site for each course taught in a term is imported into a database at the beginning of the semester. For simplicity in management and because it's so small, each course has its own individual database. The database contains pre-defined tables for the materials that will be uploaded, grades, information about the students that will populate the course, and more.

The end result is one-stop shopping to each of their courses from anywhere they have Web access.

Next, through a Web-based interface, faculty members and their support staff simply have to manage files and/or fill in forms to further develop their course site. For example, if the faculty member has a handout that they want to distribute, they log in, go to the administration page for their course, and complete a form. The form includes fields for a link title, a description of the file, a classification (e.g. handouts, assignments, lectures, etc.), a field to specify a time frame (data), if desired, that the file will be accessible, and a field used to browse and select the file to be uploaded. So, with only a few clicks, they have added content to their site.

The system allows them to upload almost any type of document (e.g. HTML, Word, PDF, PowerPoint, etc.), then dynamically creates the link, with the text specified in the link title field, to the file being uploaded. The page that the link is included on is based on the classification, so you could have a separate page for handouts, assignments, cases, and so on. Those classifications are predefined but can easily be changed at the instructor's request.

The system also includes an online grade book for each course. Grade



management also works through an upload/download process. The instructor simply manages grades in an Excel workbook and saves that workbook as a CSV file. Then, the file can be uploaded directly into the system. When it's uploaded, that file populates the grade book table in the database. If the instructor needs to update grades, he/she can simply download a copy of that file, which the database generates through an automated export process, make the necessary changes, and repeat the upload process.

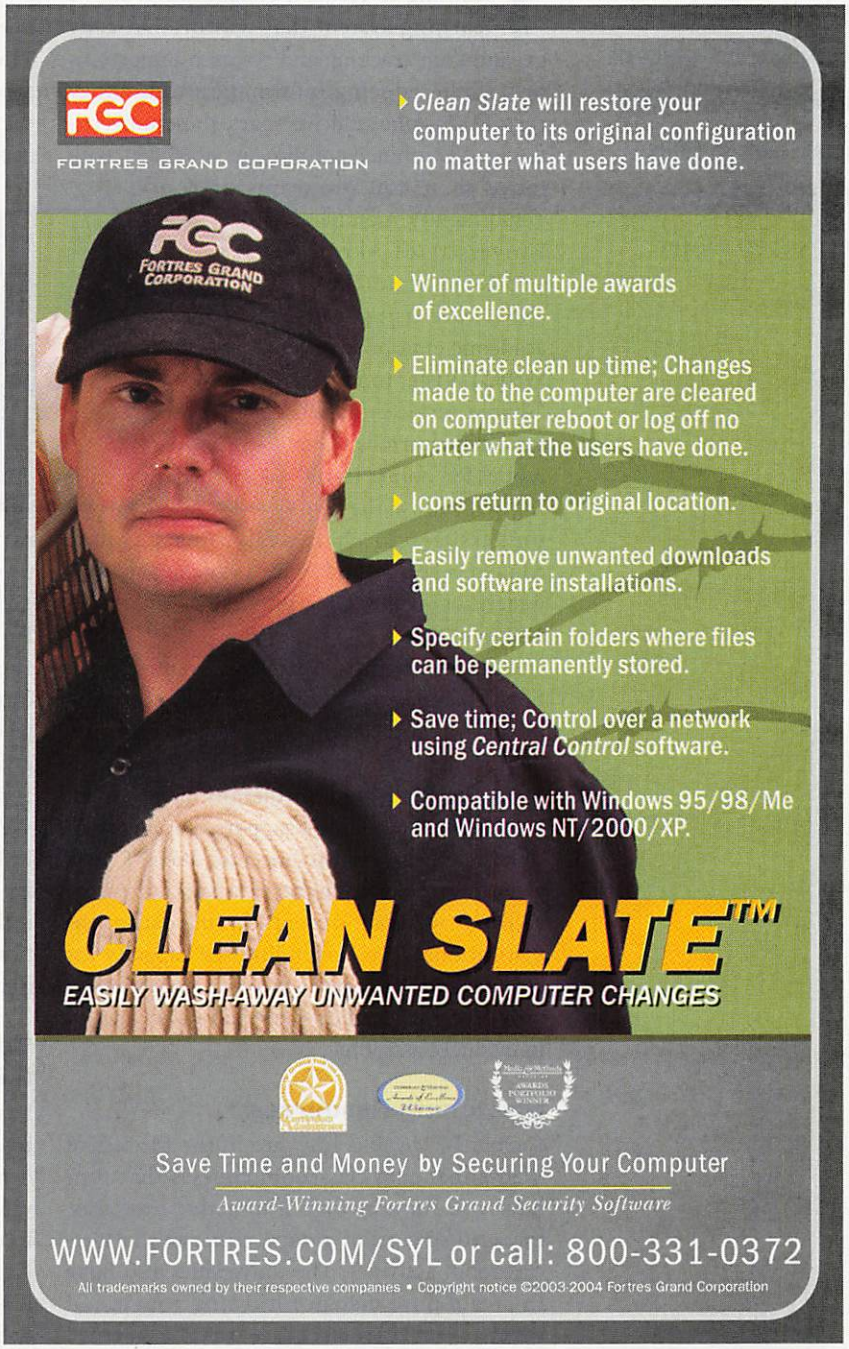
Other features include an e-mail distribution list, course announcements section, and a links archive. The e-mail distribution list is automatically created, for each class, from the student profiles. Through a Web-based e-mail option, the instructor can send e-mail to the whole class without having to use normal e-mail software to create a distribution list. This is ideal for simple message distribution. The instructor also has the option to change the text (or "announcement") that is displayed on the course home page. This announcement section lets the instructor give the students information, for example, about upcoming assignments, class cancellations, and the like. Maintaining a links archive is another option—the instructor can provide the class with a list of links relevant to the course. Finally, if they so desire, instructors can request access to a discussion forum for their class that allows for online collaboration. I should mention that the discussion forum tool used is an off-the-shelf system that we integrated into ours.

From the standpoint of the student, they first must register for a departmental portal account. Once logged into the portal, they see departmental announcements, they can create a list of their own links, and they can browse a list of current course Web sites. This list allows them to add links to the courses they are currently enrolled in. The end result is one-stop shopping, sort to speak, to each of their courses from anywhere they have Web access. It lets them easily retrieve coursework supplements, review lecture material, review grades, and communicate with the instructor. This, in fact, is beneficial to the instructor as well because they can manage course content from anywhere too!

When students enter the course for the first time, the system asks for verification that they are in the class. When they complete the verification, data relevant to them (first and last name, e-mail address, etc.) is added to the course database tables, thus creating a student profile for that student, in that course. This is when the student is added to the grade book and the e-mail distribution list.

Finally, the elegant simplicity of the system has led us to migrate from the above mentioned campuswide course management system to a complementary system for delivery of our Web-based Executive MBA program. Thus, we were able to meet different instructional needs with similar technology.

Michael Collura (colluram@purdue.edu) is an Instructional Technology Specialist, Department of Agricultural Economics, Purdue University.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Eliminate clean up time; Changes made to the computer are cleared on computer reboot or log off no matter what the users have done.
Icons return to original location.
Easily remove unwanted downloads and software installations.
Specify certain folders where files can be permanently stored.
Save time; Control over a network using Central Control software.
Compatible with Windows 95/98/Me and Windows NT/2000/XP.
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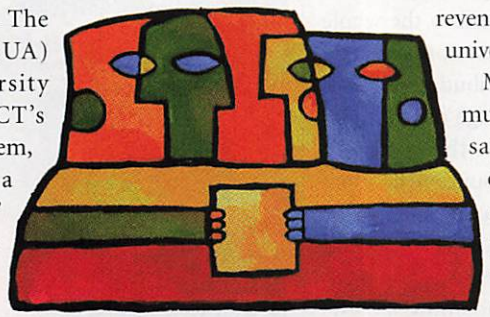
University of Akron and Kent State University create online learning initiative; Babson College blends its MBA course offerings; University of Louisville integrates handhelds into its med schools' curricula; University of Utah's research center implements a Linux high performance computing cluster.

University of Akron and Kent State University

Schools Collaborate to Create Online Learning Initiative

Two of Ohio's largest universities are teaming to create a collaborative online learning system that will dramatically expand their teaching and research opportunities, while reducing information technology costs. A 20-minute drive apart, these universities have combined enrollments of 60,000, with more than 400 programs and 1,400 faculty members. The University of Akron (UA) and Kent State University (KSU) are using WebCT's academic enterprise system, WebCT Vista, to create a "shared services model" for online learning. This model for online learning will allow the two universities to share technology, course content, research, and faculty, which could ultimately serve other Ohio universities and the K-12 community.



Especially beneficial for large, multi-institution deployments, WebCT Vista is an eLearning platform that includes a broad range of course development and delivery, content management, and learning information management capabilities. These are all supported by an extensible, enterprise-class architecture. WebCT Vista gives institutions of higher education first-time access to aggregate student learning data at the institutional level, extending the capacity for colleges and universities to access and strategically leverage learning information beyond an individual classroom.

Stretching Resources

Currently, UA and KSU are in the process of Web-enhancing classroom courses that they have in common with interactive exercises, threaded discussion groups, chats, and virtual-classroom activities. The universities also hope to create pure distance learning courses, in which all activities take place over the Internet. The intent is to improve education and research, and to stretch scarce resources. Dr. Rosemary DuMont, Associate VP of Academic Technology Services for KSU, explains, "UA and KSU began this initiative because of concern about student success. Both universities are extremely student-focused. WebCT Vista provides research data for making decisions in the future regarding student retention." Over the next five years, UA and KSU could predictably save over one million dollars in software and hardware costs. The long-term goal is for UA and KSU to become a national eLearning provider by taking the shared services model to Internet2, a high-performance network that connects 200 universities. This could generate additional revenue and prestige for both universities.

Mike Giannone, Communications Officer at UA, says, "We will be able to develop an eLearning curriculum for any given program by splitting, rather than duplicating the effort. This collaboration will broaden students' exposure to programs they might otherwise miss, while exposing faculty to research and best practices from an expanded group of peers. It offers students at both schools more choices in the classes they take, and where and how they will take them. The two universities will also share grants, content, and the ability to analyze a combined pool of learning data collected by WebCT Vista." Dr. Paul L. Gaston, provost of KSU, exclaims, "We are excited to be able to offer an even broader range of educational opportunities to our students through this collaboration! We already share academic programs, so sharing online resources is a natural next step."

Collaborative Teaching and Research

Shared services between UA and KSU are the brain child of Dr. Thomas Gaylord, Vice President and Chief Information Officer at UA. His vision initially created the project and continues to drive it. Dr. Gaylord explains, "The greatest paradigm shift for education is occurring now—it is a wonderful enlightenment. It is time to redefine what our students are; what our faculties

Illustrated by Richard Cook

are; what constitutes accredibility, and so forth. Partnerships are the 'right' thing to do. For example, why do numerous individual universities produce Algebra I online ... when collaboration makes sense? The University of Akron and Kent State University will have educational advantages over other universities in the region with probably the single, most important educational technology tool for enhancing their long-range instructional vitalities in the coming years." Because of the strategic impact of eLearning on both institutions, UA President, Dr. Luis M. Proenza and KSU President, Dr. Carol A. Cartwright, came together, with Dr. Gaylord, Dr. DuMont, and others, to drive this collaboration. Under the direction of Dr. Gaylord and Dr. DuMont, the two universities have installed a new high-speed fiber optic line, "GigaMAN," to connect their information technology systems and act as a bridge for collaborative teaching and research. Dr. Terry L Hickey, Senior Vice President and Provost at UA, explains, "In addition to partnering with Kent State, we eventually envision offering a shared resource for other northeastern Ohio schools as well as the private sector."

Deb White, Project Manager for UA and Diana Biordi, Project Manager for KSU, along with numerous others at the two universities, are working together to implement and make the collaboration work. The two institutions are currently sharing the hardware and a phone line. The software is not yet up and running, but they plan to begin course development as early as the beginning of 2003. Mike Giannone explains, "Precisely how we'll tackle the curriculum is yet to be decided, but one popular option is to first incorporate Web components where they'll have the biggest impact. This, of course, is in the most popular freshmen '101' courses, such as general math, science, composition, social studies and psychology." The overall plan envisions offering fully Web-based distance learning courses over the next two years and moving on to develop joint degree programs.

A New Business Reality

UA and KSU typify a new business reality where competitors can use technology to collaborate for mutual benefit. According to Carol Vallone, WebCT President and CEO, "Even institutions that have long competed for the best students can find areas where collaboration makes sense economically and educationally. In this case, not only will the collaboration cut costs and increase revenues, it will, most importantly, improve the educational offerings of both institutions."

The universities are looking at joint content development opportunities, including creating a database of learning objects—discrete chunks of reusable, mixable and matchable content that course developers can organize individually for just-in-time learning or to assemble into new courses. UA and KSU hope that the universities may someday evolve into a national library of courseware from which small institutions throughout the country can borrow resources for a fraction of the cost of creating their own content. Small private liberal arts schools are expected to be the first takers.

For more information, contact Dr. Thomas Gaylord at thomas_gaylord@uakron.edu (UA) or Dr. Rosemary Du Mont (KSU) at rdumont@kent.edu.

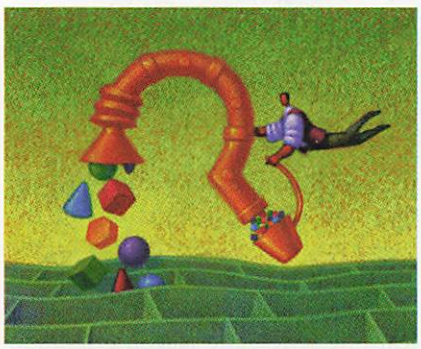
Babson College

Creating a Blended MBA Program

Stephen J. Laster

The term blended learning has many meanings. Some people view it as a blend of technologies; others view it as a blend of experiences. Babson College defines blending as using the correct delivery techniques to achieve specific learning objectives. This allows us to leverage face-to-face and technology-based learning modes—whether synchronous and asynchronous, broadcast or simulation—based on our pedagogy and learning objectives.

During the 1990s Babson College transformed its course-based MBA curriculum into an integrated set of learning experiences that immersed students in the study of business life cycles. It also transformed its undergraduate curriculum by integrating its business core and liberal arts programs and migrating to a competency-based model for outcome measurement. These early innovations positioned its faculty and program administrators to develop an MBA program that blended technology and face-to-face teaching in a semi-customized approach to learning.



In the first phase of this program, which is now in progress, Intel Corp. employees are able to earn an MBA in 27 months without leaving their jobs and without moving to Babson. Through a unique mix of on-site classroom sessions and eLearning activities, Babson's modular curriculum is delivered to the students at their locations.

Design Approach

Babson's integrated curriculum was a

Illustrated by Rob Colvin

natural starting point from which to build a blended MBA program. The development of an integrated educational program 10 years ago provided us with insights into how complex subjects could be woven together to form a complete learning experience. It also introduced the idea of segmenting or chunking the curriculum into units of learning—modules, streams, and sessions—without introducing a disruptive delivery mechanism like Web technology. This decade of experience provided Babson's faculty with time to develop a culture of integration in the design and delivery of the program. It also ingrained in them the practice of rapidly redesigning modules in a team environment, a skill that has proven critical for moving the experience online.

The design of the blended program began with the integrated curriculum, then added the idea of program delivery via technology. Several partners for platform and instructional design were chosen to form the core infrastructure and support services for the program.

Technology Delivery Model

The blended MBA was developed to support easy access to learning content, collaboration, and flexibility. The core is a learning management system integrated to a synchronous conferencing system. Supporting these Web-based platforms is CD distribution for content that may be bandwidth-intensive and to provide some learning assets in a disconnected format. The resulting student and faculty experience is a blended one where the appropriate tools can be utilized to achieve the learning objectives. As with any system, human interaction is a key critical success factor. In this case, faculty and student support are required to ensure that the technology remains transparent. Additionally, face-to-face sessions are required to teach those subjects and concepts that are not naturally supported through the technology.

The decision to partner with external technology and program-design partners was driven by Babson's belief that it should concentrate on what the College does best and by the need to develop the program in a compressed time period.

During development of the blended core curriculum, the faculty was supported with instructional designers and content developers. The role of the instructional designer was to help the faculty members translate the classroom teaching experience into a blended learning experience. That is, translating content in a way that took advantage of the delivery technology to develop a high-quality program, not just transferring teaching and class notes. It was also important not to simply emulate the classroom but to explore modes of teaching and learning that were supported by the blended model. Current technology does not allow for the kind of rapid interaction, based on emotion and body language, that is experienced in a classroom setting. Nevertheless, state-of-the-art technology, when applied to addressing learning outcomes via creative approaches, can support a teaching and learning experience of high quality.

With a sound understanding of the learning objectives of each module and stream of learning, the design team optimized the face-to-face and eLearning portions of the program to fit the demands of the content. For each subject the teams considered issues of subject complexity, learning styles, and teaching styles to arrive at a blend of experiences. Resolving issues such as whether students needed to learn "tools" first rather than diving into group immersion and team building helped to determine the role, content, and timing of the sessions.

Babson MBA Core Curriculum

A module is a carefully channeled combination of academic "streams" that flow together to define and shape a larger topic. Each successive module is designed to build upon the material of the previous one. This format facilitates the flexibility and interactive learning that are integral to an interdisciplinary approach.

The design of the program also provided an opportunity for mid-course corrections. This was facilitated by the ability to refresh the Web-based learning management system and the use of conferencing software. In one instance, when it became evident that students were struggling with learning specific techniques using the asynchronous delivery system, the program was adjusted to use synchronous conferencing and application-sharing as a new kind of faculty office-hour. While not initially planned, the change enhanced the student and faculty educational experience.

Success Factors

Setting expectations and faculty training are the two critical success factors in developing any blended or wholly online program. Program administrators and faculty enter the design phase with a set of experiences and preconceptions based on prior teaching experiences. Students, depending on their age group, also approach it with notions of how the experience "should be." A successful implementation depends on level-setting expectations and quickly developing norms of behavior.

During the design phase, the development team needs a leader or visionary to guide them through the possibilities of the new delivery environment. This guidance begins with an introduction to the toolset but then dives much deeper into pedagogy and context. Early adopters need support in determining such issues as:

- How do I teach a case online?
- What is the best approach for teaching methodology?
- What are the state-of-the-art technologies?

• What works best for teaching complex subjects?

• What should the behavioral rules for the online community look like?

Also, faculty immersion is critical. Learning how to teach in a blended format is best understood by practicing and is not easily learned through books and lectures. One idea is for educators to participate in a blended course as a student prior to teaching.

It is also important to clarify and maintain roles during the delivery of the program. Faculty need to clearly spell out the rules of engagement during face-to-face sessions and on message boards. Students will have a tendency to be the first person to respond to a new discussion thread or to monopolize a microphone during online office hours. This creates a crowding-out effect, whereby other students are discouraged from participating. To minimize this tendency, faculty and program managers must set behavioral norms early on in the program.

The technology must be transparent. While Web-based collaboration has grown in value and stability over the last few years, the technology is still not foolproof. The wide array of personal computers, firewalls, and software requires that a full-service support model be factored into the design of the program. On the program-design side, the faculty also needs support with content development and technology experimentation. Instructional designers and content developers who understand the curriculum and who can partner with faculty-thought leaders are critical.

Finally, success depends on dedicated students: A willingness to learn at a distance and the maturity to cope with ambiguity are critical.

For more information, contact Stephen J. Laster, Director of Curriculum Innovation and Technology, Babson College and Chief Technology Officer, Babson Interactive LLC, at laster@babson.edu.

University of Louisville

Med Schools Integrate Handhelds

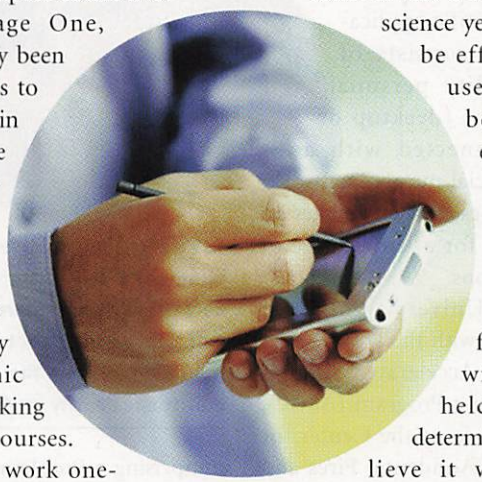
The University of Louisville's Medical and Dental Schools are among the first in the country to distribute Palm handhelds to all medical and dental students as a part of their entire four-year curricula. Other universities require handhelds for their third and forth year students (clinical stages), but providing handhelds in year one is a new trend.

Ruth Greenberg, director of academic programs at the University Health Sciences Center and director of the Office of Curriculum Development and Evaluation, says this has "set apart" the university. It wants students to become familiar with technology at the beginning of their education. Students need to understand the role technology will play in their professional lives and be comfortable using the same tools they will use as practicing physicians and dentists.

Devising a Plan

Greenberg explains that the decisions concerning which PDA to purchase, as well as the overall plan regarding handhelds, was determined by a group of medical and dental students and faculty. This group researched and studied Palm handhelds, and provided information and feedback individually and in focus groups.

According to Greenberg, the plan that was agreed upon consists of two stages. Stage One, which has recently been accomplished, was to get the hardware in the hands of the users (first year medical and dental students). Stage Two will integrate the handhelds directly into the academic programs by working with individual courses. They propose to work one-on-one with course directors in order to accomplish the second stage, which is presently occurring.



"Handhelds are part of our students' professional future," Greenberg says, explaining that handhelds are tools that can instantly connect healthcare professionals to the up-to-date resources they need at the point of patient care. Immediate access to information is a tremendous benefit and timesaver, especially in the era of managed healthcare, where time is a premium, according to Greenberg. She believes that students should learn to use a PDA in their basic science years so that they'll be efficient handheld users when they become actively engaged in patient care in years three and four.

According to Greenberg, precisely how the first year students will use the handhelds has not been determined. She does believe it will be a more didactic experience for the first and second year students. Specific activities using the handhelds are currently being planned. It is expected that students will use such resources as the medical dictionary and the five-minute clinical consult.

Numerous other components are available through handhelds, such

as drug interactions, information regarding medicines, specific patient conditions, etc. PDAs will provide all students with quick access to resources and an easier method of locating and recording information.

Building an Infrastructure

The University of Louisville's Health Sciences Center also plans to build a robust infrastructure to maximize the use of the handhelds and provide content and new applications to students via HotSync stations. When students place their handhelds in the HotSync cradle, applications and data can be quickly downloaded onto their handhelds with the touch of a button. The university is using Novell ZENworks for handhelds, a systems management product from Novell Inc., to centrally manage and update software applications, enabling the university to reduce the cost of providing IT support, while keeping students and faculty up-to-date.

The purchase of the Palm m500 handhelds follows the University of Louisville Medical School's one-year study of third-year students using handhelds in their clinical rotations. This study was conducted in the fall of 2002.

Greenberg believes it is one of the first investigations of a large group using handhelds in medical education. More than 135 students and preceptors who oversee clinical rotations participated in the study, which confirmed what Greenberg expected—handhelds are a valuable tool in medical education. Greenberg states that they are currently focused on designing an infrastructure that will allow faculty to deliver more to students on their PDAs and PDA-based activities that engage first and second year students more actively with this technology.

For more information, contact Dr. Ruth Greenberg, director of academic programs at the University Health Sciences Center and director of the Office of Curriculum Development and Evaluation, University of Louisville, at rgreenberg@louisville.edu.

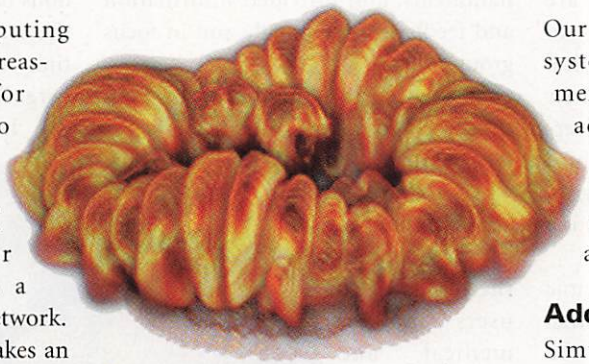
University of Utah

C-SAFE Uses Linux HPCC in Fire Research

Steven Parker

A high performance computing cluster (HPCC) is an increasingly popular method for delivering computational power to CPU-hungry scientific applications. A cluster consists of several commodity personal computer systems (desktop or rackmount) connected with a commodity or special-purpose network. The low cost of these systems makes an attractive option for a wide range of scientific applications.

In 1997, the University of Utah created an alliance with the Department of Energy (DOE) Accelerated Simulation and Computing Program (ASCP), formerly ASCI, to form the Center for the Simulation of Accidental Fires and Explosions (C-SAFE, www.csafe.utah.edu). C-SAFE focuses specifically on providing state-of-the-art, science-based tools for the numerical simulation of accidental fires and explosions, especially within the context of the handling and storage of highly flammable materials. The primary objective of C-SAFE is to provide a software system comprising a Problem Solving Environment in which fundamental chemistry and engineering physics are fully coupled with non-linear solvers, optimization, computational steering, visualization, and experimental data verification. The availability of simulations using this system will help to better evaluate the risks and safety issues associated with fires and explosions. Our goal is to integrate and deliver a system that is validated and documented for practical application to accidents involving both hydrocarbon and energetic materials. Efforts of this nature require expertise from a wide variety of academic disciplines.



The figure illustrates the volume rendered image of a ten meter heptane pool fire colored by temperature during the initial puff. The vortex structures as seen in the figure result from the miss-alignment of gravity and density gradients.

Additional Resources

Simulation of an explosive in a fire involves computing thermodynamics, fluid mechanics, chemical reactions, and other physical processes at each of millions to billions of points in the simulation domain. These scenarios require significant computing resources to perform accurately. Simulations performed to date employed hundreds to thousands of processors for days at a time to simulate portions of this problem. Fortunately, we were also granted time on the DOE ASCP computers at Los Alamos, Lawrence Livermore and Sandia National Laboratories. These machines are some of the fastest in the world, and we received considerable allocations of CPU time as a

part of the C-SAFE grant. However, sometimes these resources are not enough.

Recently, the University of Utah purchased a Linux cluster that will be used to augment the resources provided to us through the DOE. The cluster will be used for development and debugging of the simulation, parameter studies, and small- to medium-scale simulations. Large-scale computations will still require use of the larger DOE ASCP computing resources. Unlike the shared DOE resources, the cluster will be largely devoted to C-SAFE research 365 days a year.

This cluster consists of 128 Dell PowerEdge 2550 servers, each containing two Pentium 4 Xeon processors. The entire cluster contains 256 Gigabytes of main memory and over nine Terabytes of disk space. Each server (node) runs the Linux operating system, and is networked with a Gigabit Ethernet (currently being installed). This is a class of system often referred to as a Beowulf cluster, named after one of the first systems to demonstrate this concept. The cluster is listed on the November 2002 Top 500 list (www.top500.org) as the 89th fastest computer in the world.

Linux Advantage

C-SAFE chose to implement a Linux cluster for one primary reason: We could not afford a traditional supercomputer of the class and scale of those purchased by the DOE for the ASCP program. The cluster solution is based on commodity PC technology; each node is very similar to a personal computer. This leverages the mass-production of personal computers to provide a price/performance ratio unattainable by most other technologies.

Other advantages of this approach include leveraging a growing familiarity with the Linux operating system, and of course the fact that it is considered an "in vogue" thing to do in Computer Science circles. We also intend to utilize the cluster for real-time interaction with these long-running simulations, something that would be difficult to do on a larger shared resource.

However, this power does not come without caveat. First, the application must be able to perform well in this environment. A Linux cluster has communication latencies (both hardware and software) that are quite large relative to a traditional supercomputer. The C-SAFE software employs a novel approach to parallelism that helps mitigate the effects of these latencies, and we performed preliminary benchmarks that gave us confidence that we could achieve good performance on a machine of this size. Second, the installation and setup of a cluster can be quite complex and time-consuming.

Fortunately, Dell provided the physical installation of our cluster, which saved considerable time. Installation of operating systems on each of the 128 nodes, as well as installation and setup of additional HPC software, consumed considerable additional time.

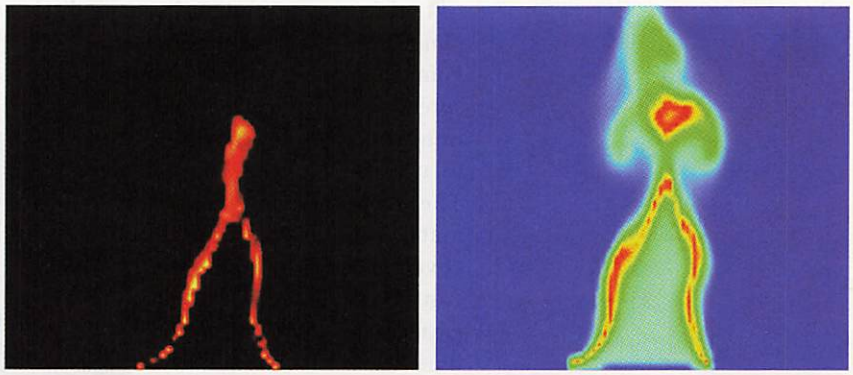
Numerous companies, both large and small, offer computational clusters of this type. The University of Utah chose Dell to implement our cluster because of a competitive price/performance ratio, company reputation, and features of the PowerEdge 2550. Dell provided physical installation and setup of the cluster, which immensely reduced the work required to deploy this machine. The cluster fills seven standard racks, stands about six feet tall, four feet deep and 14 feet long. It produces a considerable amount of heat and fan noise.

Lessons Learned

Those that are considering a large compute cluster should keep in mind several lessons that we have learned along the way (either from others or from the school of hard knocks).

First, start small; we leveraged expertise from building smaller clusters before we considered a project of this size. Second, do not underestimate the time involved in physical installation and software setup of a machine of this nature. Depending on the complexity of the required environment, this can take weeks to months. Third, planning is critical. Considerations must be taken for the power consumption, heat production and physical footprint of the machine.

Finally, the biggest lesson is that it can actually work; we are performing simulations that required computers that just five years ago cost nearly a factor of 100 more. This gives us hope that our largest simulations may be achievable on a relatively common platform in the not-too-distant future. Early access to this magnitude of resources from the DOE was critical to the development of these simulations. Once the hurdles are cleared, a high-performance cluster can provide a dramatic quantity of compute cycles for complex scientific computations such as those performed for C-SAFE research.



The figure shows 2-D slices of instantaneous temperature and soot volume fraction for a one meter heptane pool fire. As measured experimentally, peak values of soot concentration do not coincide with the spatial location of maximum temperature.

For information contact Steven Parker, Research Assistant Professor, University of Utah, at sparker@cs.utah.edu.

EDUCATOR'S REVIEW

ScreenWatch Producer 5.0 Multimedia Lectures Direct to the Web

Norman Meonske
KENT STATE UNIVERSITY

Today multimedia presentations have become a popular method to deliver class course content in many disciplines. Textbook publishers provide PowerPoint slide presentations, lecture outlines, spreadsheet applications and other electronic resources for instructors to use in their classrooms. These publisher-prepared materials generally provide coverage of the textbook concepts and save faculty a great deal of lecture preparation time. The instructors still have the ability to maintain complete control over their classroom materials by personalizing these resources by adding, deleting, or modifying them.

While these packaged resources are often useful, a new software tool, ScreenWatch Producer 5.0, provides instructors an opportunity to easily create original, high-quality multimedia presentations themselves, complete with a table of contents.

The software provides instructors the ability to create and record high-quality multimedia presentations and easily post them to the Web for playback. The full-motion and full-screen recording software combines video and/or voice of the instructor with computer applications, spreadsheets, PowerPoint, or whiteboard content in real-time for Web streaming. With a few keystrokes, the professional-grade recordings can be stored on a server without additional programming or post-production effort for immediate retrieval. The ScreenWatch application presents a lecture that is very similar to what goes on in a live traditional classroom and is available anytime for the students to view.

Applying to Instruction

PowerPoint and spreadsheet applications are frequently used to illustrate accounting concepts and procedures. I have used ScreenWatch for my accounting classes and found that the students preferred PowerPoint presentations created by ScreenWatch to the traditional in-class PowerPoint slide presentations.

The software is easy to install by a "low-tech" person. Once installed, most faculty can learn how to use the software in approximately three hours with the assistance of their computer technicians. The technical service provided by the software developer is helpful. They took me through the process of making my first ScreenWatch class from start to finish and helped the university computer technicians install the software on the university server.

ScreenWatch Producer is a screen-capture software program supporting RealServer, Linux, Solaris, HP-UX, and Windows 2000/NT systems. It records using Windows 2000 and XP and plays back using RealNetworks and Windows Media streaming technology.

Once the software is installed and running, all the instructor has to do is call up the PowerPoint presentation or any other computer application such as a spreadsheet or Word document to use for class presentations. The applications can be minimized and accessed while ScreenWatch is running. The Word document, for example, could be a lecture outline. Instructors can demonstrate the step-by-step creation of spreadsheet applications and access the Internet to demonstrate how to search or view information on a particular Web site. Everything will be captured in the lecture presentation file.

General Benefits

The software is easy to use by a relatively "low-tech" instructor. Within one day, a new user can prepare excellent class presentations. An important feature of ScreenWatch is the software compression that permits students with a dial-up modem to view the class with the same quality as using a high-speed connection. The software is ideal for an online learning environment, student-centered learning, and when students are absent from class. The video option places the instructor in a region on the screen so the viewers can see the instructor. Faculty members will appreciate the fact that they can post their presentations to their Web site immediately after recording without the help of computer technicians.

Because all students do not comprehend classroom material at the same rate, ScreenWatch can be a better way to deliver classroom lectures as students can view the lecture as many times as needed. With the easy-to-create table of contents, instructors can provide the student with a convenient way to access a specific section of the lecture. Students with learning difficulties, poor note-taking skills, or special needs are better served.

The software includes Milori Training Tools that let instructors use "hotkeys" to underline, write on the slides, magnify, spotlight a section of the computer screen, highlight screen material, or put boxes/circles around important information.

For PowerPoint presentations, I use an interactive process whereby the students mark up their paper copy of slides with my comments. I can review their work to verify that they viewed the class by grading their marked up copies of my lectures.

Advantages for Higher Ed

Faculty will like the ease of use and the ability to prepare lectures that can be used for multiple sections or in the next term. I put extra effort in designing a better lecture because I know that many lectures can be used again. I can record a live class or prepare a lecture in my office. One downside is that it took as long as 30 minutes to publish a lecture to an external server. I was permitted to work on other computer applications so the time was not lost.

The ScreenWatch lectures provide an opportunity for individual instructors or administrators to critique or evaluate the quality of instruction. These critiques may be used to supplement student evaluations. By critiquing my own ScreenWatch classes, I have been able to make improvements in my teaching methods.

For classes with multiple sections, ScreenWatch provides for consistent quality of presentation over different sections. Approximately 40 percent of my course is a ScreenWatch class. The other 60 percent of my accounting class is a more traditional class where I work accounting problems, answer questions, and interact with the students. Students are only required to attend the regular classes.

I believe ScreenWatch software should be as common as blackboards and overhead transparencies were 30 years ago once faculty experience its benefits.

Dr. Norman Meonske is a Professor of Accounting at Kent State University and an online instructor for the Beckerconviser CPA/CMA review course. To view an example of his ScreenWatch presentations, please visit: rtsp://realserver.kent.edu/nmeonske/syllabusfinal.smi.

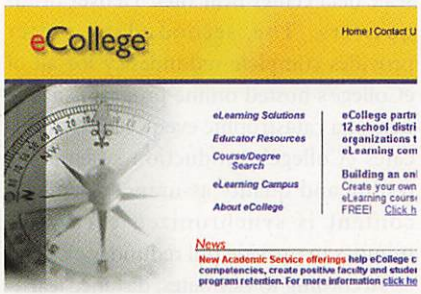
FEATURED PRODUCT

eCollege: Setting Standards for the Modern Campus

Those of you who haven't looked at Denver-based eCollege in the last year will discover that the company's mission has crystallized. As an integrated products and service provider, eCollege focuses on a comprehensive package of services, software, and technology for large distance education and online degree programs.

eCollege works with customers who are committed to one or more course programs delivered completely via the Web, rather than focusing on campus-based courses that use the Web as a vehicle for delivering support materials.

The company tailors solutions to each customer's requirements. However, the



basic eCollege package includes a campus portal system, eCollege's course management system, an online evaluation component, continuously available help desk support, and administrative support. The focus on complete integration has advantages for the user, says Bob Haimes, senior vice president of product and market management. "If you work with eCollege," says Haimes, "you get total accountability from us. Integrated means it's complete, it works, and you don't have any surprises." Plus, he says, users don't have to cut and paste products from various vendors or negotiate among them for accountability when something goes wrong.

With the eCollege system, customers are charged according to the number of enrollments in the e-programs. The pay-as-you-grow model works for both eCollege and the institutional customer. "We only make money as the program succeeds," says Oakleigh Thorne, chairman and CEO of eCollege. "This gives us

a lot of incentive to deliver the product that schools need."

The latest version of eCollege's course management system is eCollege AU+, which includes an assignment dropbox and equation builder. The dropbox is a series of baskets into which students deposit their work. Offering multiple baskets that are integrated with a gradebook allows instructors to more easily review, comment, and grade from a single location in the platform. The equation builder, developed with Design Science's WebEQ technology and integrated into the eCollege AU+ system, enables users to build and edit mathematical equations directly through the course-authoring environment with one-click access. There's no longer a need to build the equations in a different application and import them into the software.

eCollege AU+ features a unit-based design, which allows the chunking of content, activities, and assessments. The idea was to more closely follow the assignment and evaluation process that instructors actually use. AU+ includes several other unique features such as: a suite of synchronous tools called ClassLive for live group or one-on-one sessions; a series of efficiency enhancers, such as What's New, to allow an instructor to quickly see what has been done by students since last login; a calculating gradebook that provides one click access to view student work; and new functions and services to support disabled students and faculty. These exceed the Section 508 federal accessibility guidelines.

eCollege also offers content services that customers can add as needed. For instance, through eCollege's relationships with a variety of content providers, users can access course-related content in the form of XanEdu coursepacks, all with a single login, as well as published material from most academic publishers built directly into the platform. The company also sells course building, multimedia production services, and custom consulting. According to Thorne, many schools will contract initially for production services and then move to a consulting model as their own facility with the online delivery environment increases. Finally, eCollege offers free conversion services for customers who migrate their online courses to it from another vendor.

Last summer eCollege launched a new customer support program called iSupport. Described by Thorne as similar to a concierge service, iSupport provides unlimited informational advice via phone and e-mail to faculty members seven days a week. Additionally, institutions can purchase hourly blocks of design or development time that can be used by one or many faculty members.

eCollege's products and services are hosted, which allows for a high level of scalability as a program grows. It also means that upgrades in the software are handled by eCollege and everything migrates seamlessly. Clients do not have to change or reconfigure software in their own systems.

When asked about the company's strengths, both Thorne and Haimes point to eCollege's high level of reliability and performance. Last year eCollege posted an uptime rate of 99.99 percent. There were only 18 minutes of total downtime through November 2002. Says Haimes: "Many of the students who take courses using eCollege's systems are working parents who have to squeeze in their study time at odd hours. They can't afford for us to be offline when they need to study."

To better ensure that reliability, last fall the company opened a second full-scale data center near their Denver headquarters. The second data center provides complete redundancy for all of eCollege's hosted online programs in the case of a catastrophic event. It also duplicates eCollege's production systems for testing and quality assurance. Database content is synchronized every five minutes to provide full redundancy.

According to estimates, distance learning is growing at a rate of ten times that of overall enrollments in higher education. With its commitment to efficient learning software, high reliability, and customer service, eCollege is determined to play a large part in that growth.

For more information, visit www.ecollege.com.

TECHNOLOGY ROUND-UP

Web Development Tools: A Full Palette in 2003

Flash MX

The dominant professional Web development tool, Flash is a full-featured product with an omnipresent counterpart on the client side: the Flash player, which is installed on millions of personal computers and used by over 400 million Internet users. Flash files incorporate rich media in a small file size. Flash MX features video, multimedia, and application development components for creating rich Web experiences. Users can import any standard video file supported by QuickTime or Windows Media Player, including MPEG, DV (Digital Video), MOV (QuickTime), and AVI. Flash MX can manipulate, scale, rotate, skew, mask, and animate video objects. It can also make objects interactive with the help of scripting. The panel layout, accelerator keys, and publish settings are all customizable. A new intuitive user interface is available in this version. Also included are prepackaged templates and learning interactions that provide users with ready-to-go shells for dynamic Flash presentations, slide shows, menus, and quizzes. Flash MX files can be saved as Flash 5 files, so that groups of users who have the two different versions can still work with the same document. Contact: Macromedia Inc., San Francisco, Calif.; (415) 252-2000; www.macromedia.com.

Adobe GoLive 6.0

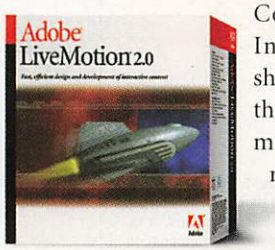
GoLive combines design, style, site management, and deployment features that permit Web designers or less experienced users to build professional Web pages. Users organize drag-and-drop text boxes, images, and other objects on a layout grid. The layout grid, actually a table formatted by the software, facili-

tates page formation. Design tools in GoLive make it possible to develop Web pages without getting tangled up in code. However, for those who wish to work at that level, code editing tools allow them to work visually in the page layout while simultaneously viewing the source code. GoLive also features site management and collaboration tools, a customizable user interface, and a dynamic site wizard. GoLive even lets users design pages for wireless devices.

This visual authoring program integrates well with other Adobe products, such as Acrobat and Photoshop. Users can publish work as PDF or SVG documents. Using PDF, developers can send the work out to reviewers, who can comment on and mark up the work directly in a file and return it to the user for changes. Users can also take a Photoshop image and bring it directly into GoLive. SmartObjects maintain the link between the image and Photoshop. Contact: Adobe Systems Inc., San Jose, Calif.; (800) 833-6687; www.adobe.com.

Adobe LiveMotion 2.0

LiveMotion takes the capabilities of GoLive and makes them dance. Tightly integrated with other Adobe products, such as Photoshop, Illustrator, GoLive, and AfterEffects, LiveMotion allows users to build animated interactive Web pages in a variety of formats, including Flash and QuickTime. LiveMotion is a compilation of prebuilt effects and tools for creativity. Users can draw from the library and style palettes for ideas or build content from the ground up using the integrated Photoshop text engine, content-creation tools, and ActionScript. ActionScript, a complete JavaScript language for creating interactivity, lets users create interactive content (without having to learn new scripting languages) and export it to the Flash player to create animated content, advanced eCommerce tools, complete Web applications, and XML-based chat rooms. LiveMotion also includes some features designed to automate tedious tasks: Developers can build automation scripts, which control all objects and commands within the LiveMotion authoring environment. Experienced developers can also create Live Tabs, user-friendly front-ends that connect invisibly to the automation scripts, speeding up the production process for the less experienced user. Contact: Adobe Systems Inc., San Jose, Calif.; (800) 833-6687; www.adobe.com.



XMetaL 3

XMetaL has won numerous awards for its accessible approach to XML content creation and editing. XMetaL has an open and scriptable development environment that allows developers to create custom tools with which any user, not just developers, can build XML and SGML documents. The complexity of XML is hidden within a user-friendly interface. XML documents can also be saved as SGML. Users of XMetaL can create or repurpose content for publication on the Web without the need to convert it from other formats. XMetaL's authoring aids provide further support via three editing view options. Context-sensitive Attribute Inspector and Element List show valid markup options at the current point in the document. XMetaL also features real-time rules checking, keyboard macros, a spell checker, and a thesaurus, as well as an advanced search and replace engine. Recently acquired by Corel Corp., XMetaL was formerly sold by SoftQuad. Contact: Corel Corp., Ottawa, Ontario, Canada; (613) 728-8200; www.corel.com.

Freeway 3.5 for Mac OS X

Freeway 3.5 for Mac OS X and OS 9 is an HTML generator that helps users build Web content with graphics and typography features—without coding. Extensive drag-and-drop capability enables users to add content from just about any source (Web pages in browsers, iPhoto, iTunes, MS Word or the desktop) straight into the Freeway document. The latest version of Freeway includes support for native Illustrator 10, Photoshop 7, TIFF, PICT, GIF, JPEG, Quicktime, MPEG, and SWF file formats. Other improvements in version 3.5 include the ability to manipulate compressed Flash files (change backgrounds and URLs), better handling of true-type fonts, and smaller Freeway file sizes. Within Freeway, users have access to all of Macintosh's fonts with full typographic control for creating GIF text. Freeway also scales image files and converts them to JPEGs, GIFs or PING files, sparing the user the need for an external graphics editor. An upgrade to Freeway 3.5 is free to owners of Freeway 3x. Contact: Softpress Inc., Sausalito, Calif.; (415) 331-4820; www.softpress.com.

NetObjects Fusion 7

Designed to accommodate the needs of the basic home Web page builder as well as an experienced Web developer, NetObjects Fusion 7 is replete with features that make it accessible. Beginning with its QuickStart building tips and tools, NetObjects Fusion 7 provides support for all proficiency levels. Novice users can build a Web site in three quick steps: choose a template, choose a style, then add the content. They can connect pages through an easy-to-use drag-and-drop layout manager that automatically adds navigation to link pages. Users can import content from other HTML sources or from other Web sites; the product also gives users the ability to import Word documents without loss of formatting. Other time saving tools include global asset management, cascading style sheets, and a library of styles from which to choose. Contact: Website Pros Inc., Jacksonville, Fla.; (877) 650-8171; www.netobjects.com.

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Motion Computing	9	(866) MTABLET	www.motioncomputing.com
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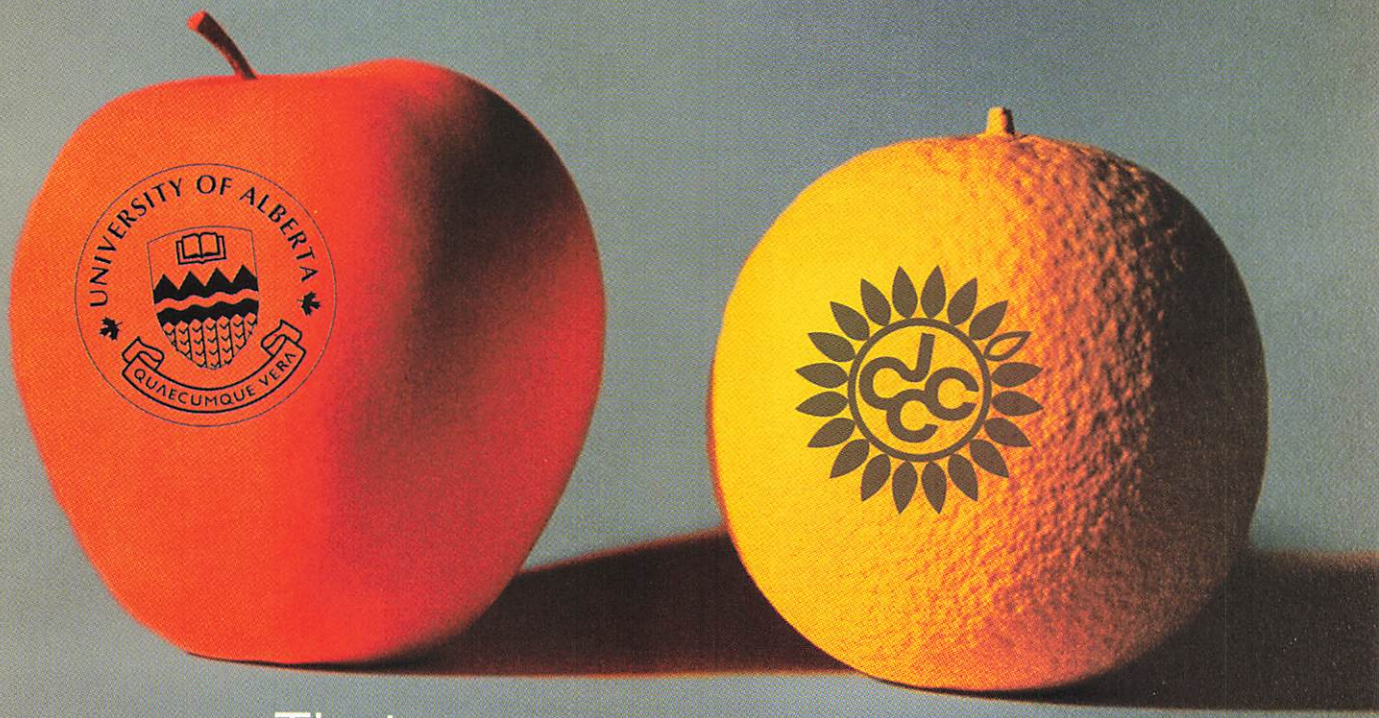

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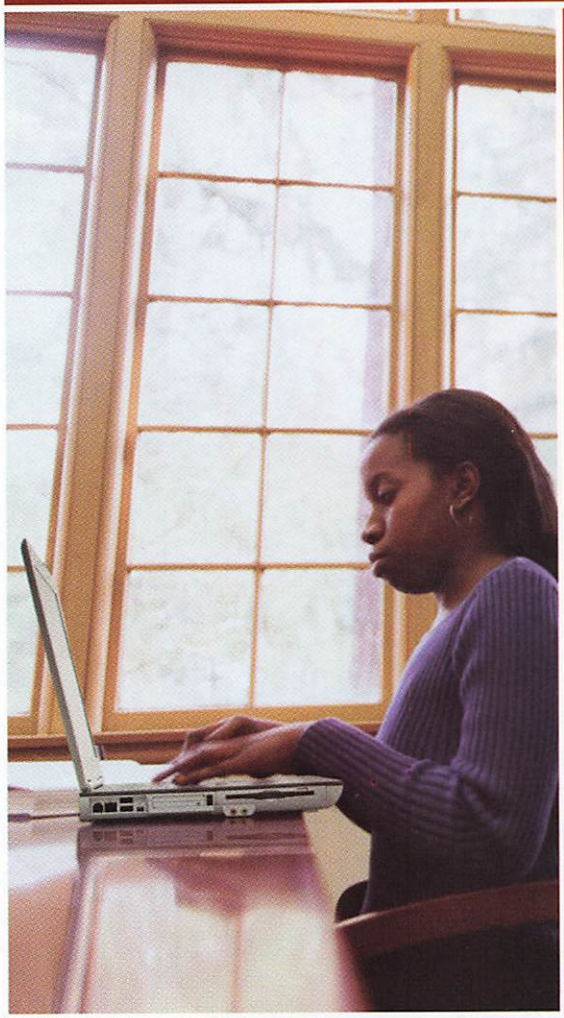

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